REFERENCE

Working Patterns and Food Behaviour within the Context of Family Life

Rachel Hambly

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Abstract

In recent years, there has been concern about the impact of work on family life, particularly the effect that current working patterns may have on food behaviour (food provision, food consumption and eating patterns) within the home. Increased female employment and long working hours may affect family functioning though little has been done to model any association. There is evidence of less food preparation within the home, increased consumption of convenience products and fragmented meal times. In addition lack of time, irregular working hours and busy lifestyle have been identified as barriers to adopting a healthier diet Lappalainen *et al* (1998); suggesting those elements of work and time may also determine the relative healthiness of the diet. The effect this may have on future generations is unknown, but if less time is spent in food related activities within the home then there may be fewer opportunities for children to gain practical food knowledge and skills. Time constraints, experienced because of work, may possibly be eased by the use of time saving strategies and products. The main food provider's practical food knowledge, attitude and cooking skills may ameliorate the impact of work on food behaviour. Whilst previous academic research has explored changing patterns of work and food consumption independently, this study is original in its attempt to combine these separate disciplines.

The aim of this research was to develop, build and test a theoretical model for exploring the relationship between working patterns and food behaviour. Following a systematic review of the literature, a conceptual framework was built to identify the key dimensions of work, food behaviour and the factors that may influence it. This was used in the development of a postal survey instrument to measure and test the research hypotheses. The sample was made up of 642 households, with children aged between 8-10 years old, (a response rate of 22%). Data was established on household patterns of eating and working in terms of the critical dimensions identified. This included food behaviour (food provider behaviour, eating behaviour of the household, healthy eating profile, shopping and cooking behaviours) and working patterns (hours, job satisfaction and time factors). Statistical analysis of the data was completed; descriptive statistics, analysis of variance and principal components were used to establish valid conclusions about relationships and test hypotheses.

The findings of the research revealed no direct association between the number of hours worked and household food behaviour; although working hours were associated with greater shared responsibility for food related tasks. This may have positive implications for working parents as the results suggest that work commitments do not automatically lead to deterioration in eating patterns with unhealthy food choices being made. An association was found between the nutrition knowledge, attitudes and skills of the main food provider and consumption of certain types of foods. The impact of work patterns on food behaviour therefore cannot simply be explained by the management and redistribution of time. Qualitative analysis reveals suggests coping strategies and the value placed on time for food and a healthy diet to be the main determinants of food behaviour. Knowledge, skills and attitudes may lead to the development of more effective coping strategies when dealing with work and home responsibilities. The implications of these findings are discussed and recommendations are made for future work.

Table of Contents

List of Tables

List of Figures

Chapter 1 - Introduction

1.1 Introduction

There is a common perception that family life has been affected by the changing nature of work, in particular changes in the workforce and in the time committed to work activities. Within the context of family life, it is possible that increased female employment and longer working hours may have contributed to recent patterns of food behaviour; less food preparation within the home, increased consumption of convenience products and fragmented meal times may be attributed to such changes in work. However, very little research has been done to understand the nature of the association between work and food behaviour.

As there is no widely acceptable definition of the term *food behaviour* it will be defined for the purposes of this research as *the set of actions, relating to all aspects of food provision and food consumption, which can be modified by an individual's knowledge, skills and attitudes.*

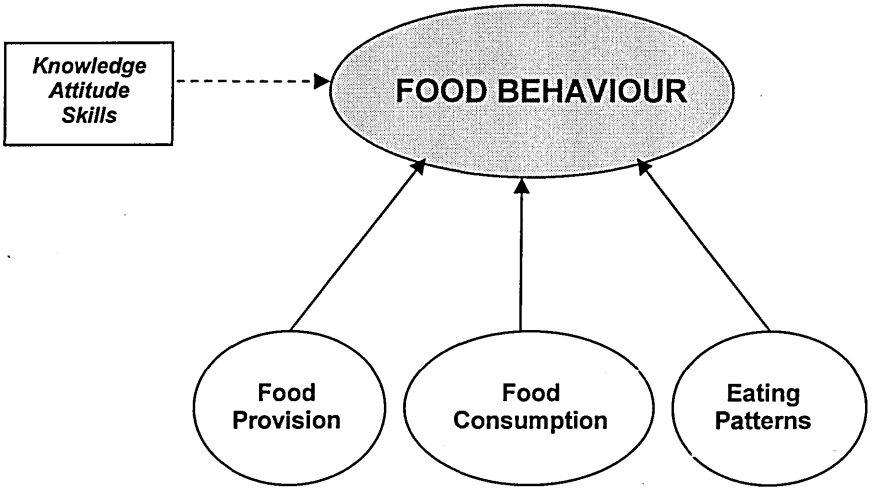


Figure 1.1 Defining Food Behaviour

Increasing female employment and long working hours have contributed to the *time famine* which many households experience, especially when trying to juggle the demands of work and family life (Gershuny 1997, Hochschild 1997, Gershuny & Sullivan 2001, Bunting 2000, Reeves 2001). In households with children, the experience of time famine may be even more acute (Gershuny 2001, Reeves 2001). However, the real cause of time famine is still unclear and it is not known whether physical lack of time, fragmentation of time, the value placed on time or a combination of these and other factors are responsible.

Warde (1999:520) has reviewed women's magazines over the past thirty years and found increasing reference to *"speed and ease of preparation"* in recipe features and other food related articles. This may suggest that time, or lack of it, is the driving force behind these changes. In support of this, a recent pan-European study, that was conducted to identify the difficulties in trying to eat healthier, identified lack of time, irregular working hours and busy lifestyle as the main barriers to adopting healthier eating habits (Lappalainen *et al*, 1998). On the other hand, Gofton (1995) argues that although food habits have changed, in particular increased use of convenience foods, time saving alone is not the driving force behind these changes. He suggests that the increasing value and importance of time generates a greater demand for convenience products rather than lack of time itself.

The impact that current patterns of work and time constraints may have on more general patterns of food behaviour is unknown. Whilst the debate has focused on issues of time and convenience food, little research has been carried out to determine the extent to which the relative healthiness of the diet is affected. Current health concerns, such as the increasing prevalence of obesity, especially in children, has turned the spotlight on food habits and food consumption. Eating patterns and food choices within the home have an important role to play in the development of healthy eating habits in later life. In addition, food provisioning activities in the home, including food shopping, food preparation and cooking, provide opportunities for practical food knowledge and skills to be gained.

There is a need for empirical data to quantify and model the impact that work may have on food behaviour. There is also a need to examine the attributes of the individual which may help ease the burden of time famine. For example, there is a need to explore how food and nutrition knowledge, practical cooking skills and attitudes to healthy eating influence food behaviour, regardless of time constraints. This research seeks to develop a model using empirical data on work and food behaviour within the context of family life. In addition, it aims to identify mediating factors involved in determining food behaviour, which may or may not be dependent on working patterns.

1.2 Aims and Objectives

The main aim of this thesis is to determine whether there is an association between work and food behaviour within the context of family life. In order to do this three main aims have been identified. The research aims are as follows:

- **To explore the nature of association between work and family food behaviour.**
- **To determine whether environmental and situational factors of the work and home environment influence the association between work and food behaviour.**
- **To determine whether characteristics of the main food provider within the home influence the association between work and food behaviour.**

The concepts of *work* and *food behaviour* are ones that have no widely accepted definition; therefore, they must be defined specifically for the purposes of this research. In addition, key confounding variables must be identified, that may intervene or mediate any association between work and food behaviour. Key confounders will be those relating to the home and work environment and the characteristics of the main food provider. The research aims have been broken down into a set of objectives, as follows:

1. **To critically evaluate the literature and develop a conceptual framework for the association between work and food behaviour.**
2. **To develop an operational model identifying variables that describe work and food behaviour. In addition, to identify appropriate confounding variables (as described above) and incorporate these into the model.**
3. **To collect empirical data on each of the operational variables, which can then be used to test for association using appropriate statistical analysis.**
4. **To review the nature of the association between work and food behaviour, and the possible interaction of confounders, within the context of the literature.**
5. **To interpret the findings and develop a hypothetical model that proposes some of the important decision processes and coping strategies involved in the organisation and management of work and family food behaviour.**

1.3 Chapter Development

The structure of the thesis is based on three main areas: Firstly, exploring the background to the research and developing a conceptual framework; this stage focuses on defining the concepts of work and food behaviour using constructs identified from the literature and incorporating these into a suitable model. Secondly, the operationalisation of the conceptual framework and examination of data. Finally, a review and discussion of the main results from both quantitative and qualitative analysis with reference to the literature; ultimately leading to a critique of the research design and recommendations for future work.

Chapter two concentrates on building definitions for the concepts of work and food behaviour and reviews the relevant literature in these areas. A conceptual framework for the research is developed and dimensions of work and food, relevant to the research aims, are identified.

Chapter three refines the research objectives by developing a set of hypotheses to be explored and presents operational model, developed from the conceptual framework, of the association between work and food behaviour.

Chapter four looks at the development of the methodology and implementation of the data collection. Also the approach used for analysis of data, including the choice of statistical tests.

Chapter five presents the results from the initial data analysis; a profile of the study population in terms of their work, food behaviour, characteristics of the main food provider and resources available within the home.

Chapter six presents the results of the further analysis. Association between the variables shown on the operational model was explored; each section exploring different hypotheses. An initial interpretation and summary of the main results is given at the end of each section.

Chapter seven summarises of results of the quantitative analysis and critically discusses these with reference to the qualitative results and literature. Limitations of the methodology and conceptual framework are discussed and a revised conceptual model is presented.

Chapter eight discusses the implications and presents the recommendations for future work.

Chapter 2 - Literature Review

2.1 Work - The Impact on Family Life

"Despite widespread acceptance of the notion that work affects family functioning, an understanding of just how work affects the family is lacking" Barling (1995:18).

To understand the association between work and family food behaviour it is important to consider the nature of work and its general impact on family life. It is also necessary to establish how work has changed over recent years and what impact these changes have had on the organisation and management of family life.

The social significance of work is immense and can have a major influence on an individual's quality of life - "*How long you live, whom you marry or live with, how much money you have, where you live and how children fare are all affected by work*" (Abercrombie & Warde, 1996:65). Undoubtedly, the single biggest change that has occurred in the workforce over the last fifty years has been the rise in female employment. Work has had both positive and negative effects on women's quality of life. Increased autonomy, self esteem, physical and psychological well-being as well as the fulfilment of career aspirations are just some of the positive outcomes resulting from women's experience of work (Barling 1995, Rout *et al* 1997, White *et al* 1997). On the other hand women's traditional role as a wife and mother can sometimes be in conflict with work commitments; *"the prevalence of married women in the labour market undermines the traditional gender division of labour, whereby men are responsible for the public sphere of paid work and women are confined to the private sphere of home life"* (Scott, 1999:144). Of course this conflict is not only experienced by married women; the changing composition of the modern nuclear family, to include cohabiting and single parent households, means that the nature of any conflict that is experienced between work and family has also altered.

As more women enter the workforce, the balance between work and family life has become the focus of much academic and popular interest. Women's traditional role as a mother and homemaker has been challenged by the increase in female employment (Newell 1996, Scott 1999). Family responsibilities for working women have not diminished but they must be managed in addition to work commitments; *"with more women moving into paid employment, and their domestic work time not falling commensurately, there is inevitably an overall increase*

in women's workloads" (Sullivan & Gershuny, 2000:9) The success with which this is achieved depends on a number of factors; support within the home, time management, coping strategies, role expectations and a family friendly work environment can all contribute to work life balance. If balance is not achieved then role overload, increased time pressures and stress may be the result.

These issues will be expanded and explored throughout this section focusing in particular on gender division within the workplace and at home. The conflict and balance between the two domains will also be examined with particular reference to the social and self-imposed expectations of women's role as mother and employee. In addition, the development of coping strategies and support systems will be addressed.

2.1.1 Female Employment

Female involvement in the workforce has steadily increased since the Second World War (Abercrombie & Warde, 1996). The workforce can be divided into three groups; those in paid employment, the unemployed who are looking for paid work and unable to find it, and finally those are neither in paid work nor looking for it, such as voluntary workers. Across all three groups, female participation within the labour market has increased (Butcher & Hutchinson, 1996). However, for the purposes of this research the workforce will only be considered in terms of those in paid employment.

The trends in employment for different groups within the female population are shown in Table 2.1. The largest increase in employment has occurred for married/cohabiting and single women with children. It has been suggested that more flexible working patterns, job sharing, term time work and part time work, offer a more supportive working environment that encourages and aids their participation within the workforce (Bevan, *et al*, 1999).

Despite increases in female employment, women are still disadvantaged in the workplace compared to men. Occupational segregation exists between the sexes; women are more likely to be employed in low grade jobs and in different occupations to men (Abercrombie & Warde, 2000:201-202). In addition to this gender segregation, women are divided by age and educational status within the workforce; younger and highly educated women are more likely to be in professional and managerial occupations whilst part-time and less skilled occupations are carried out by older and women with fewer educational qualifications (Abercrombie & Warde, 2000:202). Children also have a significant influence; discussed below.

	Employment Rates (%)	
	Spring 1997	*Spring 2000*
All women aged 16-59	67.5	68.9
All married/cohabiting	71.0	73.0
Married/cohabiting without children	74.7	76.2
Married/cohabiting with children	67.7	70.1
All single	60.3	61.7
Single without children	65.2	66.8
Single with children	43.4	48.6

Table 2.1 Trends in Female Employment - Adapted from Spring 2000 Labour Force Survey

2.1.1.1 Barriers to Female Employment

According to a government study - Trends in Female Employment (2000) - the increase in employment is unevenly distributed amongst female employees, especially those with dependent children. In particular, the age of the children influences the level of participation within the workforce, with lower levels of employment being found in those with children less than five years old. Participation is even lower still in lone mothers who have children within this age range. Whilst practical barriers to employment, such as lack of affordable and flexible childcare arrangements, have lessened to a certain extent, they are still a problem for many who wish to return to work (Bower, 2000).

Recent Government initiatives such as the New Deal for Lone Parents, Working Families Tax Credit and the National Childcare Strategy are aimed at supporting mothers who wish to work. However, this level of support is not always mirrored within organisations. The need to create a supportive and "family friendly" working environment, that allows employees to reconcile work and family responsibilities has been highlighted by the European Union (EU) (Moss, 1996). The European Commission's White Paper on European Social Policy (1994) has suggested that there is an urgent need, in the interests of society as a whole, for working life and family life to be mutually reinforcing.

Research that has focused on women's experience of work has found that women are still disadvantaged in terms of career advancement. The underlying acceptance and adoption of traditional male models of career development may hinder women within the workplace; both in terms of career advancement and role conflict (Mavin, 2000 & 2001). In a review of women

managers, White *et al* (1997) found that role conflict was managed through the adoption of coping strategies such as careful planning and redistributing household responsibilities. However, some women did not report role conflict and said that work took priority over other areas of their life, including family; a view that is synonymous with a more male orientated attitude towards work (Scott, 1999).

2.1.2 Time Spent at Work

Cooper (1999:569) states that work in the 1990s is epitomised by *"the long working hours culture"*. Increasing working hours and part-time employment have led to a decline in the traditional "nine-to-five" pattern of working (ONS, 1998b, 1999). Whilst these trends may seem contradictory they can be explained by the different groups of workers in which they are observed. Total working hours have increased for all full time employees and part time hours have increased for women. These trends, in addition to an overall decrease in unemployment, have led to an increase in the amount of time being spent at work across the population as a whole (Abercrombie & Warde, 1996); particularly in groups that previously had little involvement in the workplace.

2.1.2.1 Working Hours

UK employees work the longest hours in Europe (ONS, 1999). The average number of hours for a European employee is 40 hours whilst the average number of hours worked per week in the UK has steadily risen from 42.6 hours in 1984 to 44 hours in 1998 (ONS, 1999). In addition a quarter of all full time employees within the UK work more than 48 hours per week, which far exceeds that of European workers (ONS, 1999).

The time spent at work can be measured in terms of contract hours and work done outside these hours. According to Kodz *et al* (1998) a high proportion of UK employees work more than 10 hours in excess of their contracted hours. Some of the reasons for working such long hours include pressure of workload, individual commitment towards work, long hours culture within the organisation and a need to improve take-home pay. The cost to the individual can include increased stress, ill health, an adverse impact on personal and family relationships, not to mention reduced employment opportunities for those who are unable or unwilling to work longer hours (Schabracq & Cooper 2000, Savery & Luks 2000).

Few studies have directly investigated the effect of long working hours and their impact on family life. Now the average family is a working family, where both partners work, there may

be a link between long hours and the breakdown of the family; there is a need for research to *"see what these hours are doing directly to families and to the development of children - yet uncharted territory"* Cooper (1999:570).

2.1.2.2 Working Time Directive

The Working Time Directive became law in the UK on 1 October 1998. It was introduced to combat the long hours experienced by many workers (European Commission, 1998).
The main requirements include;

- a maximum 48 hour working week, over a rolling 17 week period
- at least one 24 hour break per week
- daily rest periods of 11 hours
- three weeks guaranteed holiday
- additional protection for night workers

Although the directive is now law in this country, individuals can opt out of the 48 hour limit if they make an agreement with their employer.

In their research looking at the implementation of the Working Time Directive, Kodz *et al* (1998) have identified two main types of intervention to tackle long working hours and the culture of long hours; first, changing work patterns by introducing more flexibility; second, changing company culture to increase awareness of the issues involved, including providing support and training for individuals.

The Working Time Directive may aid the adoption of more family friendly practices within organisations. However, due to the opt out clause, which only applies in the UK, some feel the directive is all but redundant; including an opt out option is a missed opportunity to improve the working lives of millions of people in the UK Bewick (2001).

2.1.2.3 Gender and Working Hours

Although long working hours are an issue for many UK employees only 7% of women in employment work longer than 48 hours per week (ONS, 1999). This inequality can be partially explained by the greater number of part time hours worked by women (ONS, 1998b). Very often women are unable to work longer hours due to family and household responsibilities, which still fall predominantly on women's shoulders (Court, 1995). Equal opportunities are undoubtedly legally available for women to enter most occupations but some would argue that there is still discrimination evident in the rate at which the sexes progress in their chosen

profession (Mavin, 2001). Shorter hours may be seen as a sign of lack of commitment by employers and reduce opportunities for promotion (Kodz, *et al*, 1999).

However, it is important to emphasise that not all women want to work longer hours. Many are happy working fewer hours and would welcome the opportunity to have more flexibility and control over the hours they work; especially if it means achieving a better balance between work and family life (Bower, 2000). Recent research shows that up to 40% of full time working women would prefer to work fewer hours, while less than 10% would prefer to increase their working hours (Boheim & Taylor, 2001).

2.1.2.4 Part Time Work

Part time employment, which has increased since the 1980s, was initially viewed as a means of reducing unemployment (Smith *et al*, 1998). However, this has not been the case and rather than unemployment rates falling due to the availability of part time work, the overall employment rate has increased due to the greater involvement of women in the labour market. In every EU country the rates for women's part time employment exceed those for men but as Smith *et al* (1998) observe this cannot be explained simply in terms of women's working time preferences. Many women would appreciate the opportunity to work full time hours, not only because of the financial benefits, but because of fulfilling career aspirations and enhanced autonomy (Doyal, 1994).

Unfortunately, for working women with family responsibilities, full time employment is not always an option mainly because of inadequate childcare provision. This was identified as a priority in the governments 1997 pre-budget report that states that it is a priority to develop "*a national childcare strategy to enable more parents to be available for work for longer periods of the day*". However, even with these opportunities available, women are still more likely than men to work part time out of choice (Boheim & Taylor, 2001). According to Fagan & O'Reilly (1998:22) implicit *"gender compromise"*, resulting from the traditional roles of men and women, drives women into part time employment; this allows compromise between the rise in female employment and the disproportionate division of household labour.

2.1.3 Work and Family: Redistributing Time and Responsibility

"...as hours of paid work increase, time at home becomes increasingly more harried and segmented..." (Hochschild, 1996:6)

Time use can be considered in terms of its allocation to work and non-work activities but this does not differentiate between the ways in which time is used outside work. Non-work time encompasses essential activities such as caring duties and domestic responsibilities and real free time to be spent in leisure pursuits. Therefore, a more helpful definition would be to describe "work" as paid work, "leisure" as free time and "essential" activities as family and caring responsibilities. On this basis, time use can be divided into five domains - Figure 2.1.

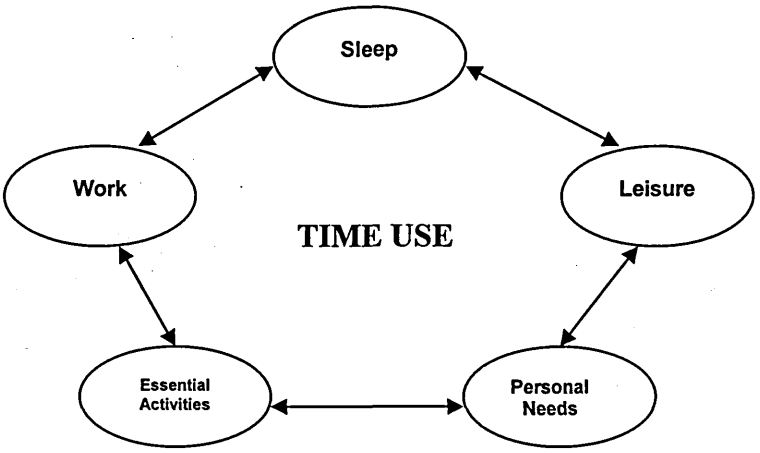


Figure 2.1 Distribution of Time

The distribution and organisation of time within each of these domains is dependent on many factors; work commitments, family responsibilities, caring duties, participation in leisure pursuits, money and the availability of resources are just some of the factors involved. Gender division of time use can be partly explained by differences in employment status and unequal distribution of household and domestic responsibilities (Gershuny *et al*, 1994). In general, men are more likely to be in full time employment and work longer hours than women, as previously discussed, although the gap is starting to close. The real discrepancy between the sexes, is the amount of time spent in household chores; women in both full time and part time employment allocate more time than men (Gregson & Lowe 1994, Doucet 1995, Schindler-Zimmerman & Addison 1997, Gershuny & Sullivan 2000). Table 2.2 shows typical use of time in an average week by employment status and gender.

	Full Time		Part Time		
Weekly time spent on:	**Male**	**Female**	**Female**	**Housewives**	**Retired**
• Employment & travel[a]	48.3*hrs*	42.6*hrs*	20.9*hrs*	0.3*hrs*	0.7*hrs*
• Essential activities[b]	24.1	39.6	52.1	58.4	33.0
• Sleep[c]	49.0	49.0	49.0	49.0	49.0
• Free time	46.6	36.8	46.0	60.3	85.3
Free time / weekday	4.5	3.3	5.4	8.4	11.6
Free time / weekend	12.1	10.3	9.5	9.3	13.6

Table 2.2 Time use in a typical week, by employment status and gender, GB 1995 (Abercrombie & Warde, 1996)

[a]Travel to and from place of work.

[b]Essential domestic work and personal care, including essential shopping, child-care, cooking, personal hygiene and appearance.

[c]An average of 7 hours sleep per night is assumed.

With the increase in female employment, domestic duties have to be combined with paid employment. Despite women working longer hours outside the home they are still responsible for the majority of household labour (Gershuny & Sullivan, 2000). The allocation of time for essential household activities, such as cleaning, washing, food preparation and cooking has had to be redistributed to take into account working hours. The redistribution and reorganisation of time has occurred in four ways:

- Less time is spent in household duties.
- Greater fragmentation in the time spent in household chores.
- Household duties being shared more equally between men and women.
- Greater use is made of time saving products and services.

2.1.4 Perspectives on Time

In previous sections the increase in female employment and amount of time committed to work have been considered in addition to the redistribution and management of household responsibility. If time use is considered in terms of households or family units, then there has undoubtedly been an increase in the total amount of time committed to work and a change in the nature of time use; directly related to the increase in female employment. Several perspectives have developed on the impact that time and time use has on the individual and family; these have been the focus of much academic and popular literature.

2.1.4.1 Busy Lifestyle - "24/7" Society

The pace of life has accelerated in recent years and the term "24/7" (referring to 24 hours 7 days a week) has become synonymous with busy lifestyle and increased demands on time. *"the accelerated pace of daily life - and resultant stress or sense of being rushed, can be put down to people's new appetite for consumption, self expression and entertainment"* (Peters 2000). An increase in anti-social patterns of work may result from the demands of a 24/7 society, as employees are forced to work whatever hours are demanded of them (Summerskill, 2000). In this case it is not only increased working hours that impact on time distribution within the household but also the *timing* of working hours. Gershuny and Sullivan (2000:21-22) have identified *"changing patterns of time-use"* and the *"sequencing of time-use"* as important factors in the development of time related pressures. Individual's and families must adopt time saving strategies taking into account the needs and schedules family members. The success with which they can do this will depend on their ability to cope, with both the demands on time and the resulting pressures.

2.1.4.2 Lack of Time - "Time Famine"

The experience of not having enough time, feeling rushed and pressured is a widely reported phenomenon in both popular and academic literature. The terms *"time famine"*, *"time bind"* and *"time squeeze"* have been adopted to describe this lack of time, commonly attributed to the pressures of modern day living (Gofton 1995, Hochschild 1997, Gershuny & Sullivan 2000). Although little empirical research has been carried out to quantify the experience of time famine, it is commonly associated with increased levels of stress and behavioural changes, as people either cope with or succumb to the *time squeeze*.

In households where two parents work full time famine is becoming more common as women juggle work, childcare and household responsibilities (Cooper, 1999). The *"work rich but time poor"* experience of working families has been cited as one of the main causes of role overload and increased stress; most commonly in women but more frequently experienced by men (Gofton 1995, Rout et al 1997, Hochschild 1997). Although the contribution that men make to household responsibilities has increased - from 15 minutes per day in 1961 to 45 minutes in 1995 (Gershuny, 1997); also see Table 2.2 - Hochschild (1997) suggests that women workers still bear the brunt of these time pressures; *"any increase in men's domestic work time has been negligible, both over time and in response to their partner's employment status"* (Gershuny & Sullivan, 2000:9).

2.1.5 Role Overload: Work Related Stress

Stress is described as the circumstances under which *"the pressures experienced exceed the individual's ability to cope"* Arnold *et al* (1998:422). Managing work and family responsibility can lead to increased stress in individual's who do not have effective strategies in place to cope with these pressures. The ability to cope describes the *"behavioural strategies that individuals use to manage stressful situations"* (Strobe & Jonas, 2001:545).

Stress symptoms can manifest themselves in number of physical and behavioural outcomes and in more severe cases can contribute to the aetiology of serious health conditions. Whilst the symptoms associated with stress can often be readily identified, the underlying cause can be more difficult to locate and is often related to a combination of factors. As individuals have different thresholds for the amount of pressure that they can cope with before experiencing stress symptoms, the *pressure threshold* and their ability to cope will determine the severity of the symptoms experienced.

Sources of stress at work can be attributed to a number of factors. Arnold *et al* (1998) have categorised these into general sources of stress within the workplace and particular sources of stress for female workers. These are summarised in Table 2.3. Many studies have considered the work related stress and role conflict often experienced by women who must juggle the demands of work and family life. The main stressors appear to be related to intrinsic factors of the work situation (Tietjen & Myers 1998, Oshagbemi 1999), gender discrimination (Scott 1999, Mavin 2000 & 2001) and role overload due to conflicting demands of work and family (Newell 1996, Cooper 1999).

General Sources of Stress	Additional Sources of Stress for Female Employees
Factors intrinsic to the job - e.g. long hours	Role expectation
Role in the organisation	"Patron" male boss
Relationships at work	Threatened male colleagues
Career development	Blocked promotion
Organisational structure and climate	Threat of sexual involvement
Home-work interface	"Wonder Woman" syndrome

Table 2.3 Sources of Stress at Work - Adapted from Arnold, *et al*, (1999)

2.1.5.1 " Wonder Woman" and "Super-Wife"

As dual career families become more common, stress resulting from juggling work and home commitments has also increased; as discussed in previous sections. The *"Wonder Woman"* syndrome refers to the pressures working women may experience if they have family and household responsibilities in addition to their work commitments (Arnold *et al*, 1999). The myth of the "S*uper-Wife"* - a woman who takes the conflicting demands of wife, mother and work all in her stride - has been linked with exhaustion and stress and increased feelings of guilt (Summerskill, 2001); also identified by White *et al* (1997:33) as an *"energy deficit"* between work and family. Newell (1996) suggests that it is here that employers and organisations can step in to ease the burden and pressure on working women; adequate childcare provision and family friendly policies may play an important role. In addition, Barling (1995:18) suggests that *"the quality of the employment experience, and not the employment status nor the quantity of employment, is critical to understanding the effects of work on family".* The employment experience may be explained in terms of job quality or work related stress; one of the main indicators of these is job satisfaction which can be considered in terms of intrinsic and extrinsic elements of the job itself and the work environment.

2.1.5.2 Job Satisfaction

When considering the overall benefits of waged employment, the nature of the job and domestic circumstances have been identified as limiting factors, especially for female workers Doyal (1994). General work stressors have been identified above but it has also been suggested that particular job characteristics and job quality have more influence on stress (Ginn & Sandell 1997, Tietjen & Myers 1998, Burke 2001); *"research on job characteristics shows considerable variance in the ways in which people experience their work, and that the differences are predictive of psychological well-being"* (Barling, 1995). However, it must be noted that some studies have attributed the higher levels of stress experienced by female employees with family responsibilities to personality differences between men and women, rather than job characteristics (Mastekaasa & Olsen, 1998).

The concept of job satisfaction is usually described using elements of the job itself, the work environment and the individual's disposition towards those elements (Arnold *et al*, 1998). Higher levels of job satisfaction have been associated with less work stress and organisational values that are more supportive of work-personal life balance (Burke, 2001); also with increased motivation and morale at work (Tietjen & Myers 1998, Cooper 1999).

2.2 Food Behaviour - Current Trends and Consequences

"...people eat what they do for a multiplicity of reasons in addition to, and sometimes in conflict with, hunger, properties of the food itself or people's own valuation of health and nutrition..." (Murcott, 1997).

In the previous section female employment and working hours were considered in terms of their impact on family life; in addition their contribution to the time famine and pressures that many households experience when trying to juggle the demands of work and family (Gershuny 1997, Gershuny & Sullivan 2001, Bunting 2000, Reeves 2001). Anecdotal evidence in both the media and popular literature point towards a change in food behaviour driven by the demands of the time starved consumer. Trends in food shopping and food preparation within the home, cooking and the types of food consumed support this with growing consumption of time-saving products and services.

In families with children the experience of time famine may be more acute (Gershuny 2001, Reeves 2001). The impact that this may have on food behaviour for future generations is uncertain. Current health concerns, such as the increasing prevalence of obesity, especially in children, have highlighted the need for research into aspects of food behaviour and their long term consequences (Power *et al* 1997, James & Ralph, 1999). Eating patterns and food choice within the home have an important role to play in the development of healthy eating habits in later life; *"poor dietary habits learned in childhood may persist into adult life"* (Owen *et al*, 1997) However, a recent survey identified lack of time and irregular working hours as two of the most significant barriers to healthy eating (Lappalainen, 1997). In addition lack of time spent in food provisioning activities, including food shopping, food preparation and cooking, may mean that there are fewer opportunities available for children to gain practical food knowledge and skills within the home (Stitt 1996, Caraher *et al* 1999).

In this section, trends in food behaviour will be considered in two ways. Firstly, the macro level looks at general patterns of food consumption, for example meal trends, food shopping patterns and new product innovations. Secondly, the micro level examines the consumption of specific food items, relating these to nutrient intakes. The latter will be discussed using information obtained from The National Food Survey (MAFF, 1995-1998) which gives an annual review of

recent and changing food consumption patterns within the UK. The impact that current food behaviour has on health and the factors that can modify food behaviour, such as practical food and nutrition knowledge, cooking skills and attitudes towards food and nutrition, will be discussed.

2.2.1 Food Provision: food shopping

Food shopping has changed significantly over the last fifty years. The move from local specialist shops for specific food purchases, to the "one stop" supermarket has led to a phenomenal range of products and services available, all under one roof. Four main supermarket chains (Asda, Safeways, Sainsburys and Tesco) now account for approximately 70% of all grocery shopping in the UK (Mintel, 2000) and their hold on the market continues to expand. Recent developments, such as city centre stores, Internet shopping and home delivery, are all aimed at easing the burden on the time starved consumer (Reuters, 2000). Sunday shopping, 24 hour opening and the introduction of city centre stores have increased the opportunities for consumers to shop. With increasing demands on time, due to work, family and busy lifestyle, accessibility outside traditional opening hours and conveniently located stores can all help in the redistribution of time; *"critical time pressures influenced the choice of retailer, shopping times and product purchases"* (McHugh *et al*, 1991)

Whilst a single weekly shopping trip is still most popular there has been a slight increase in shopping 2-3 times a month, in addition to increases in shopping 2-3 or 4-5 days a week (Mintel, 2000). This suggests that larger "bulk" shopping trips are carried out less frequently but that they are supplemented by more frequent "top up" shops throughout the week. This pattern of shopping fits well with the increased number of convenience outlets that are easily accessible for shorter shopping trips on the way home from work, during work breaks or to and from the school run.

Even though fewer main food shopping trips are being carried out, it still accounts for approximately half of the total weekly shopping time, on average two and a half hours per week for the food shopping alone (ONS, 1998). However, due to the more fragmented patterns of shopping that are emerging, this time committed to food shopping is more likely to be spread throughout the week. When it is considered as a proportion of the time devoted to all domestic activities during the week (see Table 2.2), two and a half hours does not seem a great deal, but if time pressures are experienced, this time may be reduced or the times of shopping altered to accommodate other activities. Aylott & Mitchell (1998:683) suggest that with increased female employment, and the resulting time pressures, shopping has changed from a *"social pleasure to*

a more functional chore". If this is the case access to conveniently located stores and longer opening hours have an important role to play in easing time constraints and facilitating food shopping for the time starved consumer.

2.2.2 Food Provision: food preparation

There are two perspectives to consider when thinking about the changes in time use and their impact on food preparation. Firstly, because of the increased demands on time experienced by many households, the actual amount of time available to spend in food preparation may have declined. There is certainly evidence to suggest that less time is being spent in food preparation and cooking within the home (Gershuny, 1997). Secondly, women who are working and still have the bulk of the responsibility for food preparation within the home, may feel less inclined to spend long periods of time in the kitchen at the end of the day. Therefore, it is possible that the amount of time spent in food provision is declining due to time constraints, attitudes towards food preparation or a combination of both.

Mitchell (1999) has reviewed trends in British main meal in the 1990s. Although the traditional format of meat, vegetables and potatoes is still recognisable, there has been a move towards more *convenient* food preparation as well as an increase in the consumption of convenience foods. The traditional diet which is associated with more labour intensive food preparation has been replaced by more pasta and rice based meals (NFS, 1998, 1999); requiring less preparation and cooking, especially when supplemented by ready made sauces.

2.2.3 Convenience Food

Convenience foods are traditionally associated with frozen ready meals, frozen pizza and boil in the bag rice. The range is now much more sophisticated and includes fresh deli counter options, chilled ready meals, washed and prepared vegetables and salads, fresh packet soup and pasta sauces, as well as the ubiquitous frozen products (Mintel, 2000). The choice is phenomenal, and it is no wonder that time constrained consumers are choosing such products, with ever increasing frequency. This may be at the expense of fresh ingredients that require more time and effort in preparation.

In addition to the increased availability of such time saving products, attitudes have changed. Using convenience food is no longer associated with the "lazy" cook, and such products have become a far more acceptable addition to the average shopping trolley. One reason for this could be the increased number of types of product on offer. Although convenience type foods

are primarily marketed as time and labour saving products, this is not always the main reason for purchase. Convenience products now offer an "authentic" range of cuisine's, such as Chinese, Indian, Italian, Thai, luxury ranges such as Tesco "Finest", and healthy eating ranges such as Sainsbury's "Be Good to Yourself". Limited cooking skills and lack of confidence to prepare this type of food may also lead to increased purchases of ready prepared dishes. Convenience will be discussed further in section 2.3.

2.2.4 Eating Habits

Fragmented meal times are now common in many households because of the differing commitments of family members (Mitchell 1999, Mintel 2000). The increase in convenience products and the ability to prepare food in shorter periods has meant that time does not have to be spent preparing an elaborate evening meal (Mintel 2000). Therefore, meal times tend to fit in around work commitments and leisure pursuits with less pressure experienced by family members if a meal is missed. There is also evidence to suggest that the messages we receive through media such as television have an impact not only on the types of food consumed but also the patterns of eating (Dickinson, 2000).

Snacking is also more common pattern of food consumption; fitting in with the busy lifestyles and eating on the run. Whilst snacking itself is not inherently bad, the types of food which individuals often choose as snacks can result in unhealthy eating habits (Green & Burley, 1996). Many snack foods are high in fat, salt and sugar; increased consumption of these foods may have long term consequences on health if eaten at the expense of a balanced diet.

2.2.5 General Patterns in Food Consumption

There has been considerable change in the types of food consumed as a nation within the last 50 years. The post war traditional diet of potatoes, vegetables and meat, which was still subject to rationing, gave way to a more cosmopolitan diet as society became more affluent and culturally diverse in the late 50's, 60's and 70's (Fine *et al*, 1996).

This greater cultural diversity and increased disposable income led to food manufacturers leading the way in the development of food products to meet certain lifestyle requirements (Ritson *et al*, 1986). Food production moved away from the domestic environment into the hands of the food industry, and the choice of food products catering for every palate and purse has increased exponentially.

Nowadays, it is no longer the "norm" for family meals to be based around the traditional meat and vegetables format. "Fast" food style products, such as pizzas, burgers and oven chips are more likely to form the basis of any meal, with traditional style cooking remaining the reserve of the Sunday lunch (Marshall, 1995). In addition, international influences in the food market have taken a strong hold with Chinese, Indian and Thai food readily available in the supermarkets. These are no longer the types of food which have to be eaten outside the home in a restaurant or bought at a take-away.

These changes have altered food choice, eating patterns and had an impact on nutrient intakes. Throughout the war and immediately after, the rationing system was designed to ensure adequate nutritional intakes for the population but since then there has been no coherent nutrition policy (Garrow & James, 1996). With greater choice and the dominance of the food industry, it has become more difficult for the individual to maintain control over their nutrient intakes, and indeed many within the population are unaware of the choices they should be making to maintain a healthy balance (Fine *et al*, 1996).

It is generally accepted that Western style diets, which are high in refined carbohydrates, fat, in particular saturated fat, and sodium, and low in fresh fruit and vegetables and whole grains are at the root of many health problems. Cardiovascular diseases, type II diabetes and some forms of cancer have all been linked with such diets and their related nutrient composition (Garrow & James, 1996). In addition, obesity, which has been described by the World Health Organisation (1995) as a "rising epidemic", is linked with the high energy intakes associated with such diets and exacerbated by "our incredible sloth" (Prentice & Jebb, 1995).

2.2.5.1 Recommendations for Healthy Food Consumption Patterns

The COMA Report on the Nutritional Aspects of Cardiovascular Disease (1994) made particular recommendations in terms of nutrient and food intakes - see Appendix A - Table 2.4 gives a summary of these recommendations. These recommendations are also in line with the recommendations of the COMA Report on Dietary Reference Values for Food Energy and Nutrients for the United Kingdom (1991).

In addition the nutrient and food recommendations given in the COMA Report on the Nutritional Aspects of Cardiovascular Disease (1994) have been expressed as average household food consumption per person in grams per week, and, as rough equivalents, in terms of the number of portions of different foods required to provide a diet that would meet the recommendations.

Nutrient Recommendations
Intake of saturated fatty acids no more than 10% of dietary energy.
Total intake of fat should decrease to no more than 35% of dietary energy.
Total intake of carbohydrates should increase to approximately 50% of dietary energy.
Sodium, expressed as salt (sodium chloride), intakes should decrease to no more than 6g/day.
Food Recommendations
Two portions of fish per week, of which one should be oily fish.
Use reduced fat spreads and dairy products instead of full fat products.
Replace consumption of fats high in saturated fatty acids with fats high in monounsaturated fatty acids.
Increase consumption of fruit, vegetables and potatoes by at least 50%.

Table 2.4 Summary of the COMA Recommendations on Nutrient and Food Intakes (1994)

These COMA (1994) recommendations have also been used to develop guidelines to provide the consumer with the knowledge to make appropriate healthy food choices. This is called the Balance of Good Health, and shows the proportions of foods, in terms of food groups, needed to make up a well balanced and healthy diet (MAFF, 1995b) - see Appendix B. The proportions shown on The Balance of Good Health plate have been based on the food portions given in the 1994 COMA report as discussed by Gatenby, *et al* (1995).

Although the prevalence of cardiovascular disease is starting to decline, the levels of overweight and obesity are continuing to increase. This in turn increases the risk of certain forms of cancer and the development of type II diabetes (Garrow, 1996). The healthy eating messages are available for the consumer to use but they do not always translate into positive action resulting in dietary change (Ruxton, 1999). Research that was carried out by Lappalainen *et al* (1997) to look at the barriers to adopting a healthier diet, identified a number of factors, which are discussed further in this section.

2.2.5.2 The National Food Survey

The National Food Survey (NFS) is an ongoing food surveillance programme that identifies consumer trends in the types of food purchased and looks at the trends in energy and nutrient intakes. Using NFS data allows us to identify changes in nutrient intakes, which can then be explored in relation to the prevalence of certain dietary related diseases.

Although there has been an overall decrease in the total amount of fat consumed, the total energy intake has also decreased, therefore the total amount of energy derived from fat has only

fallen from 41.9% to 38.8%, which is still higher than the 35% recommended by COMA (1994).

Summary NFS Results 1988	Summary NFS Results 1998
Average energy intake per person per household = 1998kcal/day	Average energy intake per person per household = 1740kcal/day
Energy derived from saturated fats = 17.2%	Energy derived from saturated fats = 15.2%
Daily fat consumption per person = 93g*	Daily fat consumption per person = 75g

Table 2.5 Summary and comparison of National Food Survey Results for 1988 and 1998

Comparisons can be made over a specific time period, as shown in Table 2.5, but general trends within the National Food Survey data can also be considered. In the 1998 National Food Survey report, a review was given of energy and nutrient intakes over the past 25 years from 1974 to 1998. Some of the major trends over this time period, which were identified in this report, are as follows:

- The average energy content of household food and the average amount of fats in home food supplies have fallen by about 25%.
- A steady decline in the proportion of energy derived from fats, particularly saturated fats, although this still exceeds the COMA (1994) recommendations.
- Overall intake of fresh fruit and vegetables has risen 20% since 1988, although the average intake is still below the recommended five portions per day.
- A steady increase for fruit and vegetables and fruit juice consumed.
- There has been a gradual fall in bread consumption since 1994.
- Fresh potato consumption has fallen but there has been an increase in the consumption of potato products, such as potato waffles, crisps and croquettes.

The decrease in average energy intakes from home food supplies may be due to a number of causes. Firstly, a reduction in average energy needs. Work has become less physically arduous with the decline in manufacturing and the rise in service industries. The introduction of labour saving devices within the home and workplace, increased use of central heating and increased car use have all led to a reduction in energy expenditure. Secondly, increased labour participation of women and increases in disposable income may have led to changes in the balance between amounts of food consumed inside and outside the home (NFS, 1998:59).

The consumption of food eaten outside the home has only been included in the NFS since 1994, but it is now a useful addition, especially with current lifestyle trends. Over this time period, there has been a steady increase for food energy consumed outside the home. The proportions

of energy from fats and saturated fats are much higher in food eaten out, with fat composition close to 50% of energy at its peak. There are also significant differences in fat intakes with age and gender, younger age groups and men having higher proportions of energy from fat (NFS, 1998:66-67).

2.2.6 The Consequence of Current Food Behaviour

The results from the National Food Survey show that the UK diet is still fails to meet dietary guidelines; it is too high in total fat, saturated fat, refined carbohydrates and sodium (salt), and relatively low in fresh fruit and vegetables, complex carbohydrates, such as bread, fresh potatoes and cereals. Although, general trends show a gradual improvement in the diet with a move towards these dietary guidelines across all population groups, nutritional guidelines are still not being met by the majority of the population. With greater reliance on convenience products and eating out control over individual nutrient intakes becomes even more difficult.

There are also implications for future generations in terms of acquisition of practical nutrition knowledge and cooking skills without which non-health orientated food behaviour will result (Palojoki, 1996). Traditionally, the mother served as a "role model" within the home, and passed on food knowledge and cooking skills to her children, often indirectly through observation and participation in food preparation and cooking (Caraher *et al*, 1999). With possibly fewer opportunities available for this type of interaction, there could be a loss of knowledge and skills acquisition within the home.

The introduction of the National Curriculum has affected the development of home economics in schools; in particular, the development of core skills relating to food and nutrition (Bowker, *et al*, 1998). Education and health professionals have expressed concern for the long term implications of this loss of essential core skills. Whilst home economics in its broadest sense, has remained a part of the curriculum, to be taught as part of food, design and technology, cooking skills have been "optionalised" (Stitt *et al*, 1995).

A now well publicised MORI survey (1993) that looked at levels of cooking skills in young people, found that more children knew how to play computer games or use a CD player than cook a simple meal, such as beans on toast. One possible reason for this lack of food preparation skills within young people could be the less frequent preparation of food in the home; it is also possible that the opportunities for gaining food and nutrition knowledge may also be limited. With the demise of nutrition education and cookery skills being taught in schools, and the increase in expenditure on eating away from home and use of convenience

foods (Mintel, 2000), it is possible that future generations will not gain sufficient factual or practical knowledge about food to allow them to develop healthy eating behaviours.

In response to this several education programmes have been initiated to raise the profile of food education in Britain's primary and secondary schools, for example The Focus on Food Campaign launched by the RSA in 1998. Various initiatives include the annual Focus on Food Week, an on going research programme and the production of teaching and learning support materials (RSA, 1997). The European Network of Health Promoting Schools provides support for schools to develop a whole school approach to food and nutrition, linking the national curriculum, catering services within the school and feedback from parents and pupils to develop an integrated approach to teaching and learning in this area (Bowker *et al*, 1998). Also, within the UK, some local education departments have been working in collaboration with health authorities and schools to develop a cross-curricular framework for health education, in particular issues relating to nutrition and food choice (Cramer, 1997).

2.3 Developing a Conceptual Framework for Work and Food Behaviour

In the preceding sections of this chapter, current trends in work and food behaviour have been detailed. In addition, the impact of work, in terms of time famine and stress and the effect of current food behaviour on future health have been explored. However, the links between work and food behaviour, and the nature of any association, have not been addressed. It is not evident whether there is a direct association, perhaps governed by the amount and regularity of the time available; or whether there is an indirect association related to underlying factors which intervene to moderate or over-ride the effects of time. In order to explore the issues further it is necessary to take a step back and consider general influences on food behaviour. Understanding the complex interaction of factors that determine food choice will thus aid in the development of a suitable a framework for research.

2.3.1 Determinants of Food Behaviour

The concept of *food behaviour* is one that has no widely acceptable definition. Much work that has been done to model food related activity has concentrated on food preference and food choice. Various models of food intake, food preference and food choice have been developed (reviewed in Shepherd & Sparks, 1994). One such example is shown in Figure 2.2.

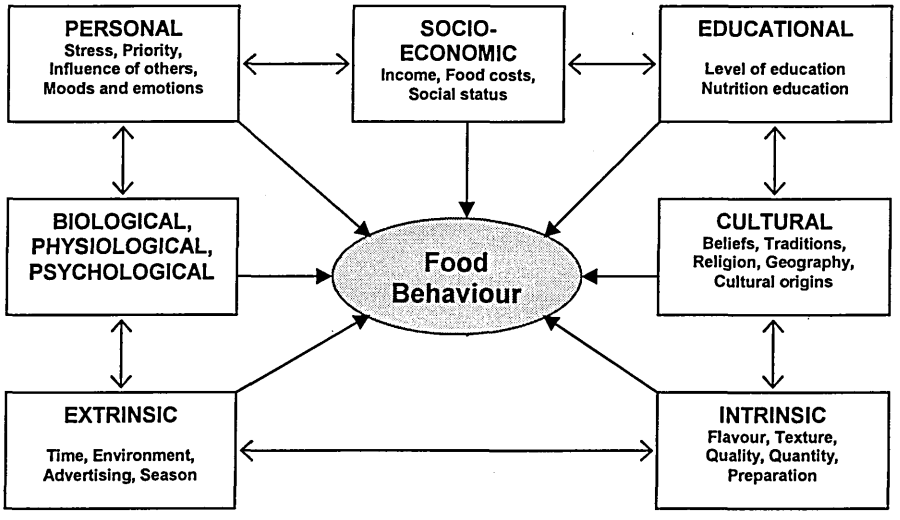


Figure 2.2 Factors Influencing Food Behaviour - Adapted from Shepherd and Sparks (1994)

The term food choice implies the selection of certain food items for consumption and is not synonymous with other food related activities, such as food shopping, food preparation and eating habits and patterns. Characteristics of the individual, the environment and the food itself will determine, to a greater or lesser extent, these additional food related activities; only the characteristics of environment and individual will be considered for this research. Throughout this research the term *food behaviour* has been used to describe food related activities, specifically food choices/consumption, food shopping, food provision and eating patterns; therefore *food behaviour* will be substituted for *food preference* and *food choice* that appear in the models.

Although models such as the one shown in Figure 2.2 identify key dimensions of food behaviour they do not describe these influencing factors in terms of their relative importance, or take into account the possible interactions between them (Shepherd, 1989). A conceptual model will be presented in this section that identifies the main factors of interest for this research. In Chapter 3 this will be developed into an operational model that shows the possible interaction and intervention of the relationships between the variables.

2.3.2 Characteristics of the Environment

The characteristics of the environment encompass the socio-economic, cultural and extrinsic factors influencing food behaviour; shown in Figure 2.2. When considering the association between work and food behaviour, work becomes the dominant environmental influence, determining availability, sequencing and re-distribution of time throughout the day.

2.3.2.1 Work - Time Factors

Lappalainen *et al* (1997) identified lack of time, irregular working hours and busy lifestyle as the main barriers to healthy eating. Of the these three, lack of time was the most frequently mentioned barrier but food preparation was also identified as a barrier, particularly in younger, highly educated individuals. This led the authors to conclude that *"people do not have the time to prepare healthy meals"* (Lappalainen *et al*, 1999:39).

In support of this time was also identified as a critical dimension in earlier research looking at food shopping and cooking cycles; McHugh *et al* (1997) found that *"many of the shoppers (women) were employed and were constrained by "time": time for shopping and time for cooking"*. In fact it is *"time famine"* that has been identified as a significant factor in the development of new modes of food consumption (Reuters, 2000); for example, snacking culture, meals eaten away from home, quick, easy food preparation and convenient home meal

replacement options. This points towards *lack of time*, or time in quantitative terms, that results from work commitments as one of the main determinants of food provision, consumption and patterns of eating.

There is a body of literature that contradicts the *lack of time* and *time famine* explanation for changing food behaviour. This perspective has focused most strongly on the increasing use of convenience foods; *"convenience relates, then, to the capacity of consumers to employ particular resources, as well as simple time availability"* (Gofton 1995:169)
The following arguments have been developed:

- Attitudes towards convenience foods have changed; they are more acceptable in today's society and not synonymous with a lazy, uncaring cook and mother (Gofton, 1995 a,b).
- Increased stress levels lead people to eat foods that require less involvement in preparation and cooking; *"when people are preoccupied with work or other stressful events, they may consume more fast or convenience foods"* (Steptoe *et al*, 1998:42).
- Greater fragmentation of the time available and differing individual schedules within families mean that it is more difficult to synchronise meal times; convenience food consumption can be a response to greater fragmentation of eating patterns, *"about timing rather than about time"* (Warde 1999:521)
- Increased time committed to work and time shortages increase the value of time (Gofton 1995b). In this case people use convenience foods not because of lack of time or timing but because they can spend their precious time in other non-food related activities. For example, *"the desire not to have to plan ahead"*, *"having little or no clearing up after eating"* and *"not having to wait long after deciding to eat"* have been identified as major influences on the consumption of convenience foods (Darian & Cohen, 1995:41-42)

This focus on convenience food illustrates the diversity of opinion relating to the association of time and food behaviour; but it concentrates on one particular aspect of consumption and does not take into account more general food intake or the relative *healthiness* of the diet. Lappalainen *et al* (1998) identified lack of time, irregular working hours and busy lifestyle as the main barriers to adopting a healthier diet; the latter two concur with the *timing* (fragmentation and sequencing) argument for the consumption of convenience food. However, more research is needed to investigate the role of *quantitative time* (as a measure of lack of time or time availability) and *timing* on more general patterns of food consumption, their relative healthiness and in the use of convenience foods. In addition, within the context of this research, to determine the extent to which work contributes to *quantitative time* and *timing*.

2.3.2.2 Work Patterns and Supportive Environment

In recent years, wider recognition has been given to the impact of work and the work environment on domestic situations. Organisations that have adopted "family friendly" policies to facilitate the reconciliation of work and home responsibilities have had positive response from employees (Cooper & Lewis 1993, Hewitt 1993, Lewis & Lewis 1996). Certain factors in the work environment have been identified as critical in maintaining psychological well-being and family functioning; namely, work schedule, job quality, role experience and control (Barling, 1995). Flexible working patterns, working from home and supportive organisational structures can ease time constraints allowing time to be redistributed according to the demands of work and family (Papalexandris & Kramer 1997, Bujaki & McKeen 1998). With increasing female employment these issues will have to be addressed by employers; *"the pressure to restructure work in order to integrate traditionally female roles will in itself force more flexible work practices into the system"* (Parkinson, 1996:46) In addition, improved job quality and enhanced autonomy (control) have been shown to reduce work related stress and improve work/life balance (Rout *et al* 1997, Savery & Luks 2000, Schabraq & Cooper 2000, Burke 2001, Bussing & Glaser 2001).

2.3.2.3 Support in the Home

Support in the home environment for food behaviour can be considered in two ways; first the way in which responsibility for food provision is shared between family members; second the use external sources of help, either paid or unpaid. In terms of food behaviour, both can have a significant impact on time use and division of labour. In section 2.1 the gender division in household labour was explored; from this emerged a picture of unequal distribution, with the woman taking most of the responsibility. This is particularly true for routine food related activities, such as shopping, food preparation and day to day cooking for the family (Mennell *et al* 1992, Kemmer 1999, Mintel 2000). However, the issue is not as simple as it would first appear and several authors have suggested the development of a *partner typology* to explain the division of domestic labour (Gregson & Lowe 1994, Gershuny *et al* 1994, Haas 1998). *"Traditional versus Symmetrical/Shared"* partnerships have been suggested by Gregson and Lowe (1994) and Haas (1998) whilst Gershuny *et al* (1994) introduce the concept of *"Adaptive"* partnerships where the man's proportion of domestic work increases when his partner gets a paid job. In addition to a more equal distribution of responsibility, external sources of help may be used to reduce the burden on one or both parents. Usually this takes two forms; paid help from a nanny or cleaner and unpaid help from friends or relatives. The use of this type of help within the home may ease time constraints and allow a more equal distribution of responsibility

but the extent to which this is achieved may still depend on partner typology. For example, Gregson and Lowe (1994) suggest the *"traditional/shared"* division of labour will still exist even if external sources of help are introduced; suggesting that external may help to ease the existing burden rather than leading to equal responsibility for household tasks.

2.3.2.4 Income

Income is a significant determinant of food behaviour. General patterns of food consumption have been linked with income; higher income groups consuming more fresh fruit and vegetables, lean meat, low fat milk and wholemeal bread; lower income groups consuming more red meat, beefburgers, sausages, whole milk, white bread and chips (MAFF 1995-1998, Shepherd *et al* 1996). Income has also been found to be a significant determinant of food consumption outside the home, with higher income groups using more take-away and eating out in restaurants (Ahuja & Walker 1994, Cullen 1994). In terms of adopting a more healthy diet, the cost of food and the price of healthy foods were identified as significant barriers by Lappalainen *et al* (1997). In terms of convenience food consumption, income has also been identified as a major influence; increasing income leading to increase in convenience food consumption Gofton (1995b). Indeed the *"dollar rich and time poor"* consumer has been identified as a major influence in changing food habits (Gofton 1995b:11). With increasing female employment and the rise in dual earner households, income may be as much of a determinant as the aforementioned issues of time.

2.3.3 Characteristics of the Individual

The characteristics of the *main food provider (MFP)* will be considered for the purposes of this research; the individual within the household that is responsible for the majority of food shopping, preparation and cooking. This is approach was adopted by Gerhardy *et al* (1995:24), who used the term "*Key Kitchen Person (KKP)*" to identify the person principally responsible for food purchase, preparation and cooking. The characteristics of the main food provider will be considered in terms of their impact on household food behaviour.

2.3.3.1 Education

Educational status has been associated with food consumption, particularly consumption of a healthy diet. Gerhardy *et al* (1995) found the educational qualifications of the KKP to correlate positively with consumption of fruit. Furthermore *"trying to eat healthy"* was identified as one of the main influences on food choice by those who had received tertiary education; *"taste"* and *"family preferences"* associated with secondary education; *"quality/freshness"* and *"price"* with

primary education (Lennernas *et al* 1997:11). In addition to the influence on food consumption, educational status may also affect division of domestic responsibility, particularly in terms of food preparation and cooking. Kemmer (1999) has shown that where the woman has equal or higher occupational status to her partner, the division of food related tasks is shared equally; in some cases the responsibility lies predominantly with the man. Finally, educational status has also been associated with the level of nutrition knowledge and cooking skills (Caraher *et al* 1999).

2.3.3.2 Job Satisfaction

Levels of job satisfaction have been linked with both work related stress (Savery & Luks 2000, 2001) and work/life balance (Barling 1995, Burke 2001, Bussing & Glasser 2001). Although job satisfaction is dependent on the work environment it is a subjective measurement and therefore becomes one of the individual characteristics that may influence food behaviour. There are several ways in which job satisfaction can be considered:

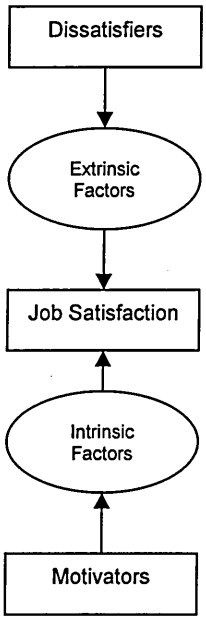


Figure 2.3a - Herzberg's Motivation Theory

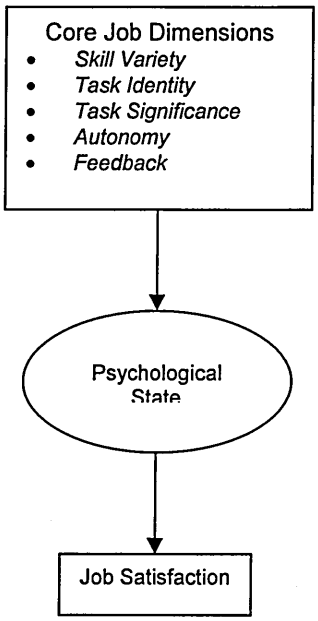


Figure 2.3b - Job Enrichment; Adapted from Leopold (2002:121)

Figure 2.3a shows a simple representation of the two factor approach presented by Herzberg *et al* (1959); cited in Tietjen and Myers (1998:226). In this model job satisfaction is represented as the outcome of two sets of variables; intrinsic factors relating to the job itself, also known as motivators; extrinsic factors relating to the work environment and relations with fellow employees, also known as hygiene factors (dissatisfiers). Figure 2.3b represents job satisfaction as an outcome of job enrichment (job design); core job dimensions will affect the individual's experience of work and thus determine job satisfaction. Work environment and the experience

of work have been associated with work related stress and work/life/family balance (see section 2.3.2.3; therefore job satisfaction may be a useful indicator of the two.

2.3.3.3 Nutrition Knowledge

The literature on food behaviour and nutrition knowledge is often contradictory. In a review of recent literature, Pirouznia (2001:62) found evidence of positive and negative associations between nutrition knowledge and healthy food choices. In a recent pan-EU study *"lack of knowledge about healthy foods"* was identified as a barrier to healthy eating in all groups; age, educational status and gender (Lappalainen et al 1997:37). The contradiction may be explained by Palojoki (1996) who has identified three areas of nutrition knowledge, relating to health orientated and non-health orientated behaviour;

- factual knowledge
- nutrition-related beliefs
- practical nutrition knowledge

Nutrition related beliefs and practical nutrition knowledge were most positively correlated with health orientated behaviour (Palojoki, 1996); a finding which may support the modern dilemma in promoting healthy eating. Very often people know the types of food they should be choosing for a healthy diet but their actual food choices do not always correspond with their level of nutrition knowledge (Ruxton, 1999). However, in support of the role of practical nutrition knowledge, some studies have identified nutrition knowledge and food preparation skills as significant influences on food intake; in particular the consumption of fresh fruit and vegetables (Burger 1997, Cox *at al* 1998, Devine *et al* 1998, Palojoki 1996, Seaman *et al* 1997).

2.3.3.4 Cooking Skills

One of the main problems when trying to define cooking skills is that the concept of *cooking* itself is not clearly defined. As Caraher *et al* (1999) point out there is *"some plasticity in what is meant by 'cooking'.... Is cooking the transformation of raw ingredients? Is the key task an assembly process? A matter of energy? Or defined as the act of re-heating? If we cook today, but re-heat half tomorrow, is that cooking?"* With the changing nature of family meals and the increased use of convenience products, cooking can only be loosely defined. Regardless of the definition, there is consensus that the possession of cooking skills improves choice available in the provision of food (Caraher *et al* 1999). It is possible that knowledge of how to choose a healthy diet together with practical cooking skills could act as coping mechanisms, particularly when faced with stress and time constraints resulting from work. If time for food preparation is restricted and the level of cooking skills possessed by the main food provider do not facilitate

quick, healthy food preparation then it is more likely that less healthy options that are more convenient will be chosen.

2.3.3.5 Attitudes to Food and Nutrition

Food and nutrition related beliefs can thus determine food behaviour through this attitudinal process. Davies (1997) conducted research to look at the differences in time allocation, food shopping and food preparation. Two groups were identified from the survey. The first group are individuals who allocate time to these activities, whether they were experiencing time pressures or not. The second group are those who do not see food shopping and meal preparation as important activities. Granzin & Bahn (1982) also found that personal values, defined as the cognitive beliefs that underlie attitudes, significantly influenced the food choices of consumers.

Therefore, whilst it is possible that time pressures may change food behaviour, it is also possible that an individual's attitude towards food provision, food preparation, and the importance of making healthy food choices may override other factors. In addition, health orientated attitudes have been linked with increased consumption of fresh fruit and vegetables and the adoption of a healthy diet;

2.3.4 Conceptual Framework

Having reviewed the existing literature and some of the main determinants of food behaviour, in terms of the characteristics of the work and home environment, and in terms of the characteristics of the main food provider, the model presented in Figure 2.2 has been revised.

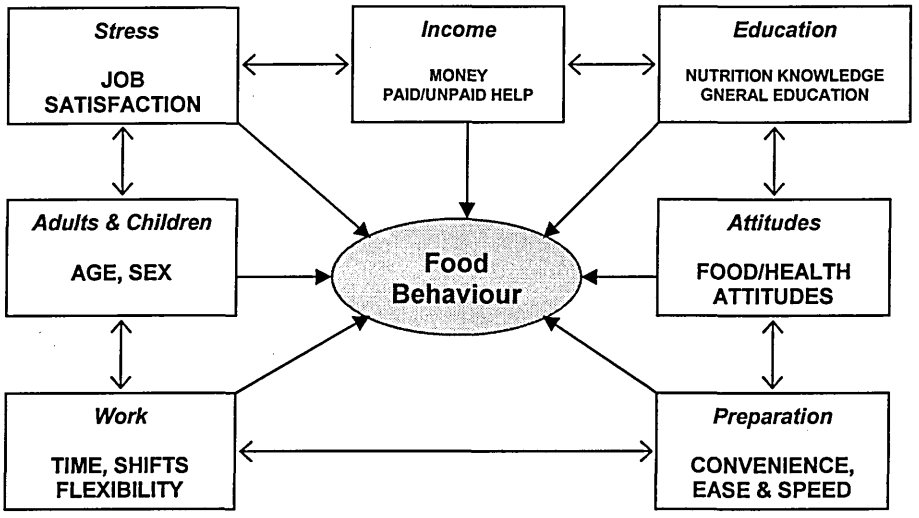


Figure 2.4 Factors Influencing Food Behaviour - Revised Model

Based on this revised model a conceptual framework for the research has been developed - Figure 2.5. This framework shows work described by constructs of *time* (quantitative time) and *timing* (location and fragmentation); characteristics of the main food provider described by knowledge, attitudes and skills; characteristics of the home environment in terms of income and support; finally, work related stress described in terms of job satisfaction.

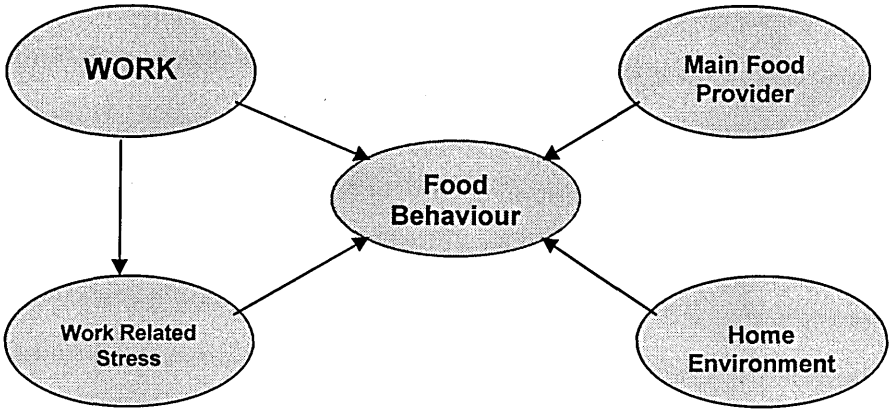


Figure 2.5 Conceptual Framework

This model does not represent the nature and mechanisms by which these variables interact in determining food intake. Therefore, an operational model that seeks to identify the direction and interaction between these variables was developed; this is presented in chapter three and used to define the research hypotheses.

Chapter 3 - Model Development

3.1 Developing an Operational Model

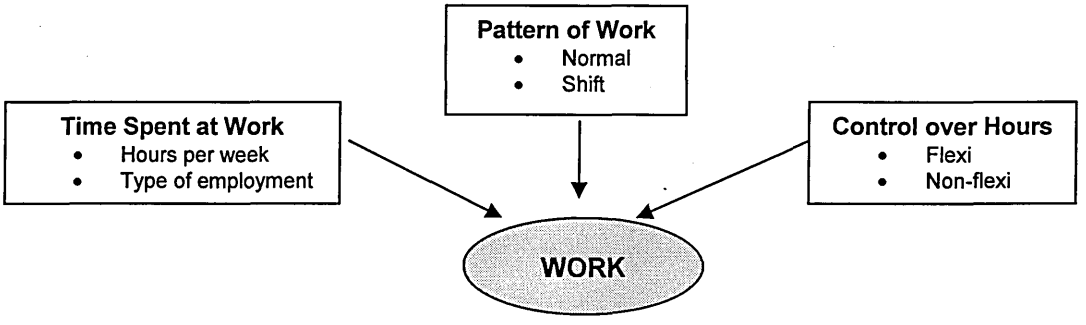
To investigate the nature of any association that exists between work and food behaviour each must be broken down into a set of indicators or variables on which data can be collected. This process has been described by De Vaus (1996:50) as *"descending the ladder of abstraction"*; a process in which an abstract concept is broken down into measurable variables. These concepts, shown in Figure 2.5, were used to develop an operational model which shows the variables to be measured and the hypothesised associations between them. It is valuable to develop such a model, even in exploratory research, as it contextualises abstract concepts and develops a framework in which to test for association.

3.1.1 Identifying Work Variables

In section 2.1 work was defined as paid employment, with three dimensions:

- the amount of time committed to work (*time*)
- the pattern of work or when the hours are worked (*timing*)
- the intrinsic control over working hours or flexibility (*timing*)

It seems justifiable to define work in this way, in terms of time commitments and the ability to redistribute work time, since the research is interested in the impact of work on time use and subsequently food behaviour. Figure 3.1 represents work using these dimensions.



3.1 Dimensions of Work - Identifying Work Variables

Work is thus defined in terms of the quantitative amount of time committed to work, the location of work time within the day and the control over working hours. Each of these dimensions has been established in chapter two as indicators in the development of time famine and stress which may in turn impact on food behaviour. Within this framework, work is thus defined as the independent variable.

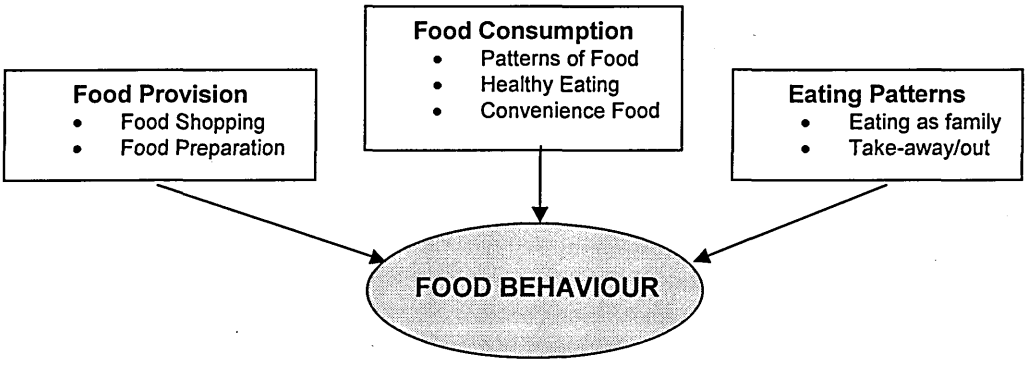
3.1.1.1 Intervening Variable - Job Satisfaction

If the inability to cope with time constraints, resulting from work committments, is exacerbated by additional work related stress then this may further impact on food behaviour. As discussed in section 2.1.5.2 job quality can be a significant indicator of work related stress and for the purposes of this research job satisfaction is used in this context as an indicator of work related stress. Job satisfaction is represented in Figure 3.3 (p.37) as intervening in the relationship between work and food behaviour. In other words, job satisfaction can be viewed as an extrinsic variable which may or may not intervene in this relationship.

3.1.2 Identifying Food Behaviour Variables

Food behaviour was discussed in section 1.1 and chapter 2. Three dimensions were identified;

- food provision - time spent and division of responsibility
- food consumption - convenience, general patterns of food intake and healthy eating
- patterns of eating - meal time habits and external food sources



3.2 Dimensions of Food Behaviour - Identifying Food Behaviour Variables

It is possible that food shopping, food preparation and cooking are significant factors in the development of time constraints, as individuals juggle work and household responsibilities. However, for the purposes of this research, they have been considered as elements of food behaviour, which may be changed by work commitments and the experience of time constraints. Thus, within this context food behaviour is defined as the dependant variable.

3.1.2.3 Mediating Variables - Nutrition Knowledge, Attitudes and Cooking Skills

As the model in Figure 3.1 shows, nutrition knowledge, cooking skills and attitudes to food and healthy eating are significant factors in determining food choice. When these choices have to be made, taking into account work and the pressures experienced due to time constraints, the

impact of these factors may have an important mediating role in determining food behaviour. This may occur in two ways. Firstly, attitudes and knowledge may override the experience of time famine. For example, individuals who believe that a healthy diet is important and have the knowledge and skills at their disposal to make the right choices and prepare food within the home will prioritise food behaviour. In this case, time constraints and work commitments will have little affect and healthy food will be chosen and prepared regardless of time constraints. Secondly, nutrition knowledge, cooking skills and health orientation in attitudes may intervene by modifying food behaviour when time constraints are experienced. For example, if adequate knowledge and skills are not possessed there may be greater reliance on convenience type products, if time pressures are experienced, with little concern about the nutritional content. However, if knowledge and skills are adequate, healthy nutritious food can be chosen and prepared quickly in the time that is available despite the experience of time famine. Thus, knowledge attitudes and skills may be seen as variables that mediate the behaviour of the main food provider and ultimately mediate the relationship between work and food behaviour.

3.1.3 Confounding Variables

The confounding variables are characteristics of the home environment. These variables are extrinsic to the work environment and independent of the main food provider yet may still affect the relationship between work and food behaviour. For example, income rather than time constraints may be a greater determinant of food choice. Ready prepared food products (bagged salads as opposed to whole salad ingredients) may be purchased because there is more money available for such items rather than a lack of time for preparation. Similarly, receiving help within the home for domestic tasks may also mask the true nature of the relationship between work and food related activities within the home by altering distribution of time and labour.

3.1.4 Model Development

The operational model is shown in Figure 3.3. In this model work and food behaviour are represented as concepts by the shaded ovals; these are concepts that are not directly measured themselves but described by a set of measurable variables. The variables to be measured are shown in the boxes that are linked to each concept by a thin black arrow; for the purposes of this research work is the independent variable and food behaviour the dependent variable. The hypothesised association between the two is shown by the thick black arrow. Mediating and confounding variables, for characteristics of the household environment and main food provider respectively, are represented by the boxed italics. These are shown to intervene in the main association between work and food behaviour by the dotted arrows.

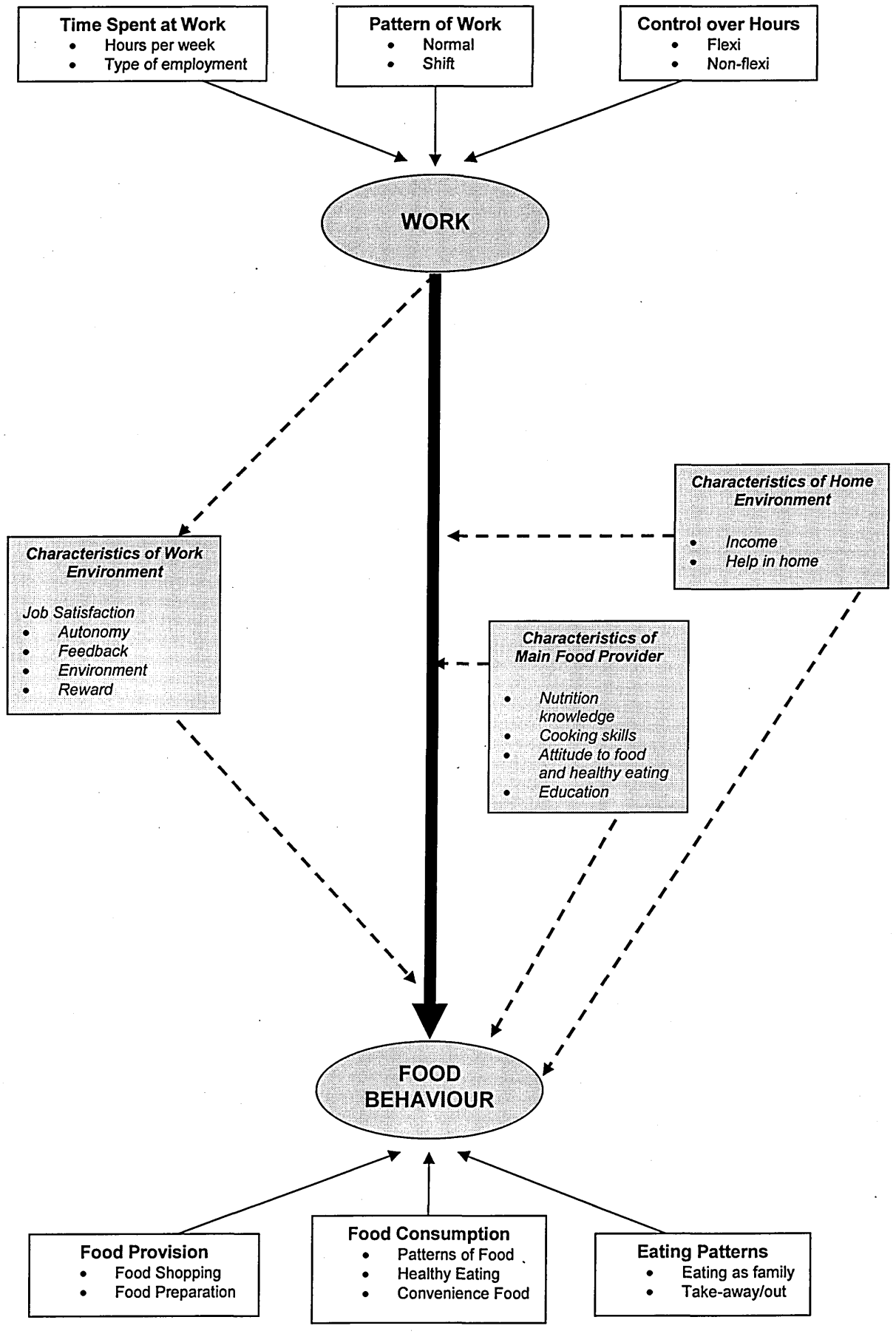


Figure 3.3 Modelling the Association between Work and Food Behaviour - Operational Model

3.2 Hypotheses to be Tested

The operational model has been used to develop a set of hypotheses; these were used to guide the analysis. Each set of hypotheses relates to one of the arrows (whole and dotted) on the model shown in Figure 3.2, relating to each particular line of enquiry. The hypotheses are stated in terms of a positive association between the dependent and independent variable; this is unconventional as the null hypothesis is usually quoted. This has been done to maintain consistency with the discussion relating to the conceptual framework.

Hypotheses 1 - **Time Committed to Work and Food Behaviour**

The total number of hours committed to work each week[a] will influence the food behaviour of the household such that:

- as working hours increase less time is spent food shopping and food preparation
- as working hours increase the responsibility for food shopping and food preparation changes to accommodate work commitments
- as working hours increase the greater the consumption of convenience products
- as working hours increase food consumption changes to accommodate work commitments and the balance of food groups within the diet becomes less health orientated
- as working hours increase fewer meals are eaten together as a family

[a]Working hours will be considered for the main food provider, the other adult, and for the main food provider and other adult combined which will be used to represent the total number of hours committed to work per household.

Hypotheses 2 - **Flexibility, Working Pattern and Food Behaviour**

The flexibility over the hours worked and pattern of work of the main food provider and other adult will influence the food behaviour of the household so that:

- the ability to work flexi-time will increase the time spent in food shopping and food preparation
- shift work will decrease the time spent in food shopping and food preparation
- the ability to work flexi-time changes the responsibility for food shopping and food preparation to accommodate work commitments
- shift work changes the responsibility for food shopping and food preparation to accommodate work commitments

- the ability to work flexi-time decreases the consumption of convenience products
- shift work increases the consumption of convenience products
- the ability to work flexi-time leads to changes in food consumption to accommodate work commitments and the balance of food groups within the diet becomes more health orientated
- shift work leads to changes in food consumption to accommodate work commitments and the balance of food groups within the diet becomes less health orientated
- the ability to work flexi-time means that more meals are eaten together as a family
- shift work means that fewer meals are eaten together as a family

Hypotheses 3 - **Job Satisfaction and Food Behaviour**

Job satisfaction[b] will influence food behaviour of the household so that:

- as job satisfaction increases more time is spent food shopping and food preparation
- as job satisfaction increases the responsibility for food shopping and food preparation changes to accommodate work commitments
- as job satisfaction increases the consumption of convenience products decreases
- as job satisfaction increases food consumption changes and the balance of food groups within the diet becomes more health orientated
- as job satisfaction increases more meals are eaten together as a family

[b]**Job satisfaction is taken as a total score and individual scores for Autonomy, Feedback, Environment & Reward.**

Hypotheses 4 - **Nutrition Knowledge and Food Behaviour**

The nutrition knowledge of the main food provider will influence the food behaviour of the household such that:

- as nutrition knowledge increases more time is spent in food shopping and food preparation
- as nutrition knowledge increases the responsibility for food shopping and food preparation changes
- as nutrition knowledge increases the consumption of convenience products decreases
- as nutrition knowledge increases food consumption changes and the balance of food groups within the diet becomes more health orientated
- as nutrition knowledge increases more meals are eaten together as a family

Hypotheses 5 - **Attitude towards Food & Nutrition and Food Behaviour**

The attitude of the main food provider will influence the food behaviour of the household such that:

- a positive attitude leads to more time spent in food shopping and food preparation
- a positive attitude changes the responsibility for food shopping and food preparation within the household
- a positive attitude decreases the consumption of convenience products
- a positive attitude changes food consumption and the balance of food groups within the diet becomes more health orientated
- a positive attitude leads to more meals eaten together as a family

Hypotheses 6 - **Cooking Skills and Food Behaviour**

The cooking skills of the main food provider will influence the food behaviour of the household such that:

- as cooking skills increase more time is spent in food shopping and food preparation
- as cooking skills increase the responsibility for food shopping and food preparation changes
- as cooking skills increase the consumption of convenience products decreases
- as cooking skills increase food consumption changes and the balance of food groups within the diet becomes more health orientated
- as cooking skills increase more meals are eaten together as a family

Hypotheses 7 - **Income, Work and Food Behaviour**

The total household income will influence the work and food behaviour of the household such that:

- higher income will result from longer working hours and higher levels of job satisfaction
- higher income households will have a more balanced diet and increased consumption of healthy food items, such as fresh fruit and vegetables
- higher income households will be more likely to use paid help within the home for household responsibilities

Hypotheses 8 - **Education, Work and Food Behaviour**

The educational status of the main food provider will affect the work and food behaviour of the household such that:

- higher levels of education will lead to increased working hours and higher levels of job satisfaction for the main food provider
- higher levels of education in the main food provider will mean that households will have a more balanced diet and increased consumption of healthy food items, such as fresh fruit and vegetables
- higher levels of education in the main food provider will be associated with higher nutrition knowledge, more health orientated attitudes to food and nutrition and greater confidence in cooking skills

Hypotheses 9 - **Formal Nutrition Education and Food Behaviour**

The level of formal nutrition education received by the main food provider will affect the work and food behaviour of the household such that:

- having formal nutrition education will lead to a more balanced diet and increased consumption of healthy food items, such as fresh fruit and vegetables
- having formal nutrition education will be associated with higher levels of nutrition knowledge, more health orientated attitudes to food and nutrition and greater confidence in cooking skills

Hypotheses 10 - **Support within the Home and Food Behaviour**

Support within the home will influence the food behaviour of the household such that:

- the more support there is within the home less time is spent in food shopping and food preparation
- support within the home changes the responsibility for food shopping and food preparation
- support within the home decreases the consumption of convenience products
- support within the home changes food consumption and the balance of food groups within the diet becomes more health orientated
- support within the home means that more meals are eaten together as a family

Chapter 4 - Research Design & Methodology

4.1 Research Design

Empirical researchers *"need to focus attention on their research design and methodology to ensure that their conclusions are indeed a reflection of their hypotheses"* (Madu, 1998:348). Although this statement refers to research that was carried out in the field of quality management it is applicable in a more general sense to all research design. As little research had been previously undertaken in this area a deductive/inductive research design was chosen; illustrated by Figure 4.1 which shows the cyclical nature of the research process.

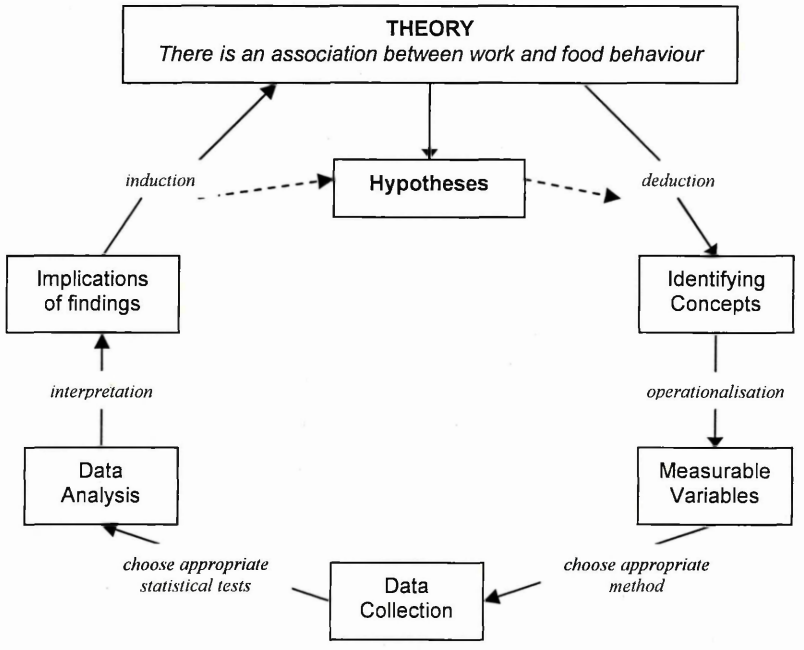


Figure 4.1 The Research Process (Adapted from De Vaus 1996:21)

The first stage of the research design was to move from abstract theory to develop a conceptual framework within which observations could be made. This was achieved from a review of the literature and evidence to support the supposition that there is a relationship between work and food behaviour. The derivation of the hypotheses and variables to be measured within this framework are detailed in chapters two and three; this is the initial deductive phase of the research process. The next stage was to find an appropriate methodology for the collection of data. Details of this process are given in the remainder of this section, including reviews of appropriate methods of data collection and general methodological considerations. Finally, the inductive phase of the research is detailed in the latter chapters of this thesis where analysis and interpretation of the observations are made.

4.1.1 Methodological Considerations

Murcott (1997) summarised the different approaches that can be taken to measure a complex concept such as food behaviour and identified three main approaches:

1. Individuals can simply be asked what they do, either through questionnaires or interviews.
2. Actions can be observed, with or without interventions such as trials and experiments.
3. Existing evidence of activities can be collected and analysed, using sources of information such as official statistics on a national level or till receipts on a more individual level.

Integrating each of these would be the most effective method but due to time and budget constraints, these guidelines could not be followed exactly.

It was decided that a survey design would be the most appropriate as it would allow a broader overview of the working patterns and food behaviour of the study population to be obtained. Although the case study approach would have provided very detailed information, especially if time use diaries had been used, only a very small sample could have been reached. A larger sample size would also increase the validity of the data, although any inferences that could be drawn would only be applicable to our study population.

4.1.2 Measuring Food Behaviour

Measuring food consumption is notoriously difficult. Under controlled laboratory conditions, it is possible to obtain a relatively accurate and reliable measure of individuals' food consumption. This is not the case with free-living individuals, who are subject to a constant bombardment of environmental and social factors that influence their food choices. Food consumption has most commonly been measured using quantitative research tools and much research concentrates on developing and improving currently available techniques. Household inventory, food frequency, food diaries, 24-hour recall and dietary history are widely accepted methods of recording food intake in free-living individuals. Willett (1990) gives a detailed account of these widely recognised methods of data collection within this area. The suitability of each technique will depend on the characteristics of the study population and the nature of the information required. For example, if detailed nutritional analysis is necessary then a comprehensive account of food intake, including portion size and cooking techniques will be required. Such information can only be obtained using weighed diet diaries. If more general patterns of food consumption are required then less detail is necessary. All techniques are subject to response and sampling bias, and methodology must be designed to minimise this as far as possible, although it cannot be eliminated altogether (Davies, 1993).

4.1.2.1 Real time methods

Methods, such as household inventory and weighed food diaries, provide detailed data that can be interpreted on a macro- and micro-nutrient level, as well as giving more general information on the types of food consumed. Whilst yielding superior data, this must be weighed against the cost, in terms of equipment, field survey time and data processing (Fehilly, 1993). The participation and motivation of subjects is essential when using these methods, and a thorough briefing must be given to all participants before data collection commences. Even then, problems exist similar to those encountered for time budget diaries, where a subject may record information falsely due to forgetfulness or negative feelings associated with their actions. Where group mean intakes, representing habitual food choices, are the prerequisite of the research, less detailed methods may be sufficient (Fehilly, 1993).

4.1.2.2 Retrospective methods

24 hour recall, food frequency and dietary history are methods of measuring food intake relating to the recent or distant past (Davies, 1993). The data obtained from these methods cannot be interpreted at a detailed nutritional level, however patterns of food consumption are perhaps more readily identified. Where these methods do hold their own is in increased subject participation. They are less time consuming and invasive than weighed, or even estimated, records of food intake; for these reasons alone subjects would be more likely to participate. They are less costly in terms of administration and field support and in the processing and analysis of data. However, they are still subject to error due to misreporting frequencies of consumption and under or over reporting quantities of foods consumed (Fehilly, 1993).

4.1.1.3 Sales data

Sales data, in the form of till receipts, is now becoming more widely used, either on its own or supplementary to more traditional methods of measuring food intake. Narhinen *et al* (1999, 2000) used supermarket sales data to assess changes in food intake in response to a staged health promotion campaign. The sales data was used to look at consumption of single food items and of one or many food items as a percentage of defined food groups. A similar approach was taken by Davies and Worrall (1998) who analysed food purchase data to show selections across the food groups and the degree or extent of unhealthiness of the food consumption, based on the percentage swing away from recommended dietary patterns.

4.1.1.4 Nutrition Knowledge and Attitude

Measuring nutrition knowledge is not one dimensional, it involves more than just assessing the level of understanding that an individual has about the nutrient quality of the foods they consume. Palojoki (1997) identified three domains within nutrition knowledge and related them to health orientated and non-health orientated behaviour. These domains include factual knowledge (e.g. the level of formal home economics education), nutrition related beliefs (correct or incorrect these attitudes will influence food choice), and practical knowledge (self-assessment of food preparation skills and confidence in choosing healthy foods).

Kemm and Booth (1992) have discussed approaches to the measurement of both factual and practical nutrition knowledge, emphasising the importance of contextualising the questions so that they relate to a particular area of the nutrient content or quality of foods. For example, questions may be designed to focus on an area relating to current dietary guidelines such as fat intake or energy balance.

Questionnaires are commonly used to obtain quantitative data regarding attitudes towards nutrition, or indeed any other aspect of food behaviour. Likert scale questions have been developed to assess the strength of belief on a number of aspects of food behaviour. Such attitudinal data has been used to describe food behaviour and link food shopping and meal preparation (Chetthamrongchai & Davies 2000, Davies 1997).

Murcott (1997) takes a more qualitative approach and favours focus groups and semi-structured interviews as methods of obtaining information to try and explain the conflict between nutrition knowledge scores and certain food behaviours, which can be described in some cases as less than ideal, emphasising that knowledge does not always inform action.

4.1.3 Sample Frame for the Study Population

Work was identified as one of the key concepts in the research therefore it was important to identify a population in sufficient employment to give rise to a range of working patterns. The first selection that was made was to identify areas within Sheffield that had higher rates of employment. To do this the Sheffield statistics for 1998 were used to identify wards that had an unemployment rate below 5% (Herzmark, 1997) - see Appendix C.

The second consideration was the type of household to be targeted within these wards. Due to the previously mentioned issues surrounding changing food behaviour and the impact on future

generations, it was decided to target households with primary school age children. Children within this age range were considered more appropriate than secondary school children who may have more control over their own food choices and possibly less involvement in household food behaviour. Therefore, it was decided to target households with at least one child aged between 8-10 years. For this reason a random sample of the electoral register, within the specified wards, was deemed inappropriate due to the possible inclusion of childless households, or households with children outside the specified age range.

It was decided that primary schools within the specified wards would be used to identify a sample with children aged between 8-10yrs. By contacting the parents of all year four and year five pupils a suitable sample was identified. The headteachers of the schools were contacted and provided with information on the study. They were then asked if they would be willing to participate in the study, by sending a letter home with their year four and five pupils. Further discussion of this process can be found in section 5.3 and a list of all the schools included in the study can be found in Appendix D.

4.1.4 Method of Data Collection

The main method of data collection was a self-administered postal questionnaire. Although it was sent to each household via the children in year 4 and year 5 of the selected schools, it can be considered in the same way as a traditional postal distribution as the researcher had no face to face contact with the study population. This method also eliminated any influence from the interviewer on the response given. Due to the sensitive nature of some of the information to be collected, a more truthful and accurate response may have been given if the respondent were allowed to complete the questionnaire anonymously. For example, food consumption is notoriously difficult to collect accurate information on as people often respond with what they think they should be eating rather than what has actually been consumed, as they think judgements are going to be made. Although the response rate is sometimes lower for postal surveys, this can be minimised by making the questionnaire easy to complete, assuring the respondent of the importance of their reply and using follow up letters as a reminder.

4.2 Questionnaire Design and Testing

Once it had been decided that the main tool for data collection would be a self administered postal questionnaire, the question content and layout was developed. There were general points to be taken into consideration and more specific points with regard to each particular section. The basic design of the questionnaire was such that each section had questions relating to one particular dimension of the study, and was divided as follows;

- Section A - Paid Employment
- Section B - Providing Food for the Family
- Section C - Family Food Consumption
- Section D - Food and Nutrition
- Section E - Background Information

It was important to make these distinctions and separate the questions in this way to avoid confusion and set the context for each section. This enabled the respondent to concentrate on answering questions relating to one particular subject at a time. An example of the final questionnaire can be found in Appendix E.

4.2.1 General Considerations

To enable accurate and reliable information to be collected for each variable the question type was given careful consideration. De Vaus (1996:24) identifies four main types of question that are commonly used in questionnaire design;

- Behaviour - finding out about "what" people do.
- Belief - finding out what people think is true.
- Attitude - finding out what people think is desirable.
- Attribute - finding out certain characteristics of the people in question.

For example, questions designed to obtain information on the current working patterns of the adults within each of the households needed to be behavioural type questions to find out what hours they worked per week and the patterns of work. Therefore, each question on the questionnaire was designed thinking about the type of data that was required to describe each of the variables. More details will be given in each of the following sub sections. The majority of the questions were closed format where the respondent was asked to choose from a number of

provided answers. A few open ended format questions were included where it was desirable to obtain additional information from the respondents about their general feelings or opinions.

4.2.1.1 Identifying the main food provider

As the questionnaire was divided into sections which separated work activities from food activities it needed to be made clear which members of the household were to complete each section. Each household was asked to designate a "Main Food Provider" who was responsible for the majority of household food preparation and provision. Section A was to be completed by both adults within the household and the remainder of the questionnaire was to be completed by the main food provider. This distinction was made as the belief and attitude questions on food and nutrition knowledge and cooking skills were to be related to food provision and consumption, thus it was important to maintain consistency throughout.

4.2.1.2 Questionnaire Layout

The questionnaire was distributed via the schools, and there was no personal contact with the study population so the layout was designed to be simple and easy to follow. The wording of each question was simplified as far as possible to avoid ambiguity and to ensure that it was not leading in nature, thus introducing bias into the answers given. The questions were printed on one side of the paper and although this did make the questionnaire quite long, 12 pages in total, it avoided any questions being missed due to being printed on the back of pages. The majority of questions were closed, sufficient space was left for open ended questions. The back of each page was also blank so there was ample space if the respondent felt inclined to provide additional information.

4.2.2 Paid Employment - Questionnaire Section A

This section of the questionnaire was divided into two identical sets of questions for the main food provider and the second adult to answer. It was designed to collect information from both adults if two were available.

4.2.2.1 Occupation and type of work

The adults were asked to state their occupation and their type of employment, either full, part time or self employed. The occupation was then used to classify the household into one of nine socio-economic groups, and depending on the higher classification the occupation of either

adult was used. The employment type was self selected and the hours for each classification, in particular full or part time, was not specified.

4.2.2.2 Time committed to work

The adults were asked to indicate the average amount of time committed to work in terms of the number of hours worked per week and the number of days. They were also asked to indicate their normal working hours, and whether they worked in the evenings or at weekends.

4.2.2.3 Flexibility

Flexibility was measured using six non-traditional working patterns. On reflection these did not give an accurate representation of flexibility within the working hours as some of the work patterns, such as shift work and term time work do not lead to necessarily flexible hours. Therefore, although the descriptive results are given in section 6.2 for these patterns of work, only the opportunity to work flexi-time is taken as an indicator of true flexibility.

4.2.2.4 Job Satisfaction

Job satisfaction is most commonly and accurately recorded using multi-item rather than single item measurements. Burke (2001) and Oshagbemi (1999) have used seven item and eight item measurements respectively to successfully measure job satisfaction. When measuring the following aspects of job quality it is difficult to obtain a purely objective assessment of each indicator. The very nature of this type of question gives rise to hypothetical constructs, as only the individual can make a subjective assessment of each indicator. Therefore, theory surrounding attitude measurement can be applied to this particular dimension of work. It was decided that a Likert-type scale would be utilised, as advocated by Procter (1993), using a seven point scale to assess individual attitudes towards the following indicators of job quality.

Positive Aspects of Job Quality

Each of the following are contributors to job satisfaction - they will be measured on a scale of 1-5 (1 being least satisfactory and 5 being most satisfactory).

- *Decision authority* - ability to work independently and make decisions and freedom to decide how to do the work.
- *Skill discretion* - challenging or stimulating work, task variety, sense of accomplishment and competence, opportunities for advancement and learning.
- *Salary* - the income.

- *Service to others* - being needed by others, work contributing to the good of the company, having a positive impact on others and helping others.
- *Flexibility* - flexibility to respond to non work situations, setting own work schedule, hours to fit needs of individual.

Negative Aspects of Job Quality

Each of the following are contributors to job stress - they will be measured on a scale of 1-5 (1 being least stressful and 5 being most stressful).

- *Job Demands* - juggling conflicting tasks or duties, having too much to do, job too demanding.
- *Dead-End Job* - dullness, monotony and lack of variety, little chance for advancement, not using skills.
- *Hazard Exposure* - being exposed to illness or injury.
- *Low Pay* - income, making less than others in similar line of work, making less money than individual feel they deserve.

4.2.3 Family Food Provision - Questionnaire Section B

The food provision section consists of questions relating to food shopping, food preparation and eating occasion. The main aim of this section of the questionnaire was to gather data that would allow food provisioning activities to be studied in terms of time consumption and division of labour. There were also questions relating to external sources of help, ranging from the use of take-away and eating out to help within the home from paid or unpaid sources. Marshall (1995) describes food behaviour from the food provisioning perspective and defines it as a process that contains the following dimensions;

- *routinisation* (how often an eating occasion takes place)
- *content* (what food is consumed)
- *participation* (who is involved)
- *method* (how the food is consumed)
- *function* (the significance of the meal occasion)

From this the time and division of responsibility for food shopping and food preparation were identified as the key variables to be used to describe food provision.

4.2.3.1 Food Shopping

Knowledge of current food shopping patterns can be obtained using computerised sales data that has been used to collect very accurate information on food purchasing activities (Narhinen, *et al*

(1999, 2000), Reeves (1999)). Not only does this method provide details of the types of food purchased, but also the date and time of the shopping trip. One problem with such methods is that individuals often dislike disclosing the personal type of information that can be found on till receipts, such as the amount spent on food purchases and the method of payment. Although information on the types of food purchased is very accurate, they do not allow for seasonal or other types of variation, and for this reason can only be taken as accurate and reliable at the time of collection. An alternative approach has been to use time budget diaries, which record information on how people spend time in their daily lives, and provide very accurate information on the amount of time spent in daily activities (Gershuny, 1997). These methods provide detailed data on shopping patterns (e.g. when and how long), but they are a very labour intensive methods of data collection and involve a great deal of motivation and commitment on behalf of the subjects involved in the study.

Questionnaires have been used to "simply ask people to tell us what they do" (Murcott, 1997). Subjects can be asked to recall shopping activities for a defined period, such as the previous week, or asked to give details of a more general nature, such as average frequency and duration of shopping trips (Chetthamrongchai & Davies, 2000). Such data will always be less accurate than real time data but it has the advantage of being able to be used for more general descriptions of behaviour and enhanced subject participation.

Interviews and focus groups have also been used to collect qualitative data on shopping activities. Hare, *et al* (2001) conducted interviews to identify positive and negative incidents related to food shopping activities. Although data was not collected on the frequency and duration of shopping trips, key elements that contributed to the shopping experience were identified. Davies (1997) used focus groups to develop a qualitative understanding of food shopping and meal preparation. The results from the focus groups were used to develop a questionnaire to assess people's attitudes to time, food shopping and meal preparation.

Respondents were asked to think about general shopping patterns, e.g. "what usually happens" rather than give details for any specific time period. The food shopping was divided into "main" food shopping and "top-up" food shopping on the basis of the most common types of shopping patterns identified by market research groups such as Mintel. A single shopping trip in which the bulky and main food items are purchased is usually carried out once a week. This is then supplemented by additional, smaller shopping trips to obtain items which have run out and/or need to be purchased more frequently to ensure freshness, e.g. milk and bread. Therefore, the respondent was asked to write down the number of times a "main" food shopping and a "top-up" food shopping trip were carried out, and to also indicate when these shopping

trips took place, e.g. time during the week, day of week, breaks from work. It was important to find out when the main and top-up food shopping trips were taking place as this provided information about how food shopping was incorporated into usual weekly timescales. The respondent was also asked to indicate how much time was taken in total for all shopping trips per week, and how the adults shared the responsibility for food shopping between them.

4.2.3.2 Food Preparation

Similarly to food shopping, data collected on meal preparation and food provision within the home can focus either on meal content, timing and duration, or division of labour. Both quantitative and qualitative techniques have been employed. Time budget diaries again provide data on the time spent in food preparation activities (Gershuny, 1997), however the majority of research in this area has focused on the division of labour and has yielded mainly qualitative data.

Caraher *et al* (1999) analysed empirical data, on the frequency of meal preparation and confidence in cooking skills that had been collected through structured individual interviews as part of the 1993 Health and Lifestyle Survey. They found significant gender divisions in both the frequency of meal preparation and confidence in cooking skills, results that are supported by numerous qualitative studies (REF). Kemmer (1999) tape recorded interviews with 22 heterosexual couples, about the division of domestic labour, and found only two households where the man prepared the evening meal on most occasions. Little evidence has been found of research carried out to collect quantitative data on both the timing and duration of meal preparation, and the division of domestic labour specifically related to food preparation.

The focus of these questions was amount of the time spent in food preparation during the week and at the weekend, and once again the division of labour between the adults in the household. It was important to differentiate between the time spent in food preparation during the week and at the weekend. Time committed to work activities is significantly greater during the week therefore it was important to determine whether the shift in time was reflected in food preparation.

4.2.3.3 Eating Occasion

The respondent was asked to give details of the frequency with which take-away or home delivered food was eaten as a family, during the week and at the weekend. In addition, the frequency with which the main family meal was eaten as a family, with adults and children, or with children and adults eating separately.

4.2.3.4 Help in the Home

Help in the home was divided into two categories; paid and unpaid help. Due to the informal nature of unpaid help, the respondent was only asked to think about regular unpaid help that was received rather than occasional help. In both cases the respondent was asked to give details of the source and type of help and the number of hours per week. This enabled paid domestic services and regular help from either family or friends to be taken into account.

4.2.3.5 Additional Comments

At the end of the food provision section an open ended question asked the main food provider to give any additional information relating to food activities.

4.2.4 Family Food Consumption - Questionnaire Section C

The layout and design of the food consumption section was based on a traditional food frequency questionnaire. It was adapted from the conventional food frequency questionnaire format which is usually designed to investigate individual food intake, therefore modifications had to be made as no instruments were found which measured household food intake.

The content of the food consumption section was designed specifically for this study and was developed using the food items from the COMA report (1994). The report gives an illustrative example of average household food consumption if the COMA recommendations were met. As the example specifically states that the figures represent national averages per person per household and not recommendations for individuals it was appropriate to base our household food frequency items on those given in the report. A total of 54 food items were identified to describe the 26 food groups that appear on the COMA (1994) recommendations.

The main food provider was asked to complete this section thinking about the average consumption within the household for each food item. Individual food preferences were not taken into account and the respondent was asked to consider general food consumption within the household. Only one response per food item was allowed, so seasonal variation in food consumption was ignored.

The frequency categories were based on those used in the aforementioned EPIC and IFR food frequency questionnaires. To allow recommendations to be made with COMA (1994) the

average intake per person, per week was needed, therefore the categories were able to be scaled up or down as appropriate to obtain a weekly figure for consumption.

4.2.4.1 Convenience Products

In addition to the main food frequency section the consumption of convenience products was also considered. Little empirical research has been carried out to gather data on the use of convenience products or time/labour saving products and services. Gofton (1995) and Warde (1999) have considered the use of convenience food in relation to time constraints but did not collect quantitative data, relying on food survey data to support their arguments for increasing consumption of these types of products. Warde (1999) suggests that as the notion of convenience foods per se can be highly contested, no study can look solely at the use of such products without consideration of attitudes and personal values related to time resources. Therefore, although data can be collected using the same methods as general food consumption data (see section 2.3.5), the classification of a product as "convenient" or "time saving" must be left to the discretion of the investigator or supported by attitudinal data relating to the individual's perceptions of time use. The items chosen were representative of the foods which have seen the greatest growth in consumption in terms of convenience products (Mintel, 2000). As these food items could not be converted into average portion sizes, the data was designed to measure frequency consumption of these types of product.

4.2.5 Characteristics of the main food provider - Questionnaire Section D

The main aim in this section was to obtain data on the nutrition knowledge of the main food providers and on their attitudes towards healthy food choices and food provision. In addition questions were asked about the level of general education, nutrition related education and cooking skills which the main food provider possessed.

4.2.5.1 Nutrition Knowledge

The nutrition knowledge questions found in Section D on the questionnaire were designed to test the factual nutrition knowledge of the main food provider. There were 25 questions to which the response was either "True" or "False" - there was no option for the respondent to answer "Don't Know", therefore if a question was left unanswered this was taken as an incorrect response. The questions were designed to examine knowledge of five main areas related to healthy eating, namely fat intake, energy intake, fibre intake, sodium intake and fruit and vegetable consumption.

4.2.5.2 Attitude to Food and Nutrition

In addition to what the main food provider actually believed to be true, it was also important to determine their attitudes towards healthy food choices. One of the most common dilemmas of health professionals when trying to promote healthy eating is that although people often "know" what is good and bad for them this does not always translate into appropriate food choices being made. The attitude of the individual or the value they place on a healthy diet is often of greater importance than their factual food and nutrition knowledge (Kemm & Booth 1992, Lappalainen *et al* 1997). Therefore, a set of 20 statements were drawn up to test the main food provider's attitude towards fat intake, eating patterns, food preparation and general healthy eating guidelines. Each statements was scored from 1-5 with higher scores corresponding to attitudes which would support healthier food choices being made.

4.2.5.3 Education and Cooking Skills

The main food provider was asked to give information on their level of general education and also whether they had received any type of formal nutrition education, for example home economics at school. They were also asked to indicate their main sources of nutrition knowledge and cooking skills from a list of 8 alternatives. They could tick all that applied. These was included so that the levels of nutrition knowledge and attitudes could be compared with the main sources of information, and also give an indication of the sources most readily utilised which would be useful for planning future health promotion interventions.

4.2.6 Background Information - Questionnaire Section E

This final section of the questionnaire was designed to obtain data on the attributes of each household. The questions asked about the number of adults and children living in the household, the total household income, car access and health. The question on income was closed format with five income bands for the respondent to choose from. It is common for respondents to object to answering such personal questions, and they often leave them blank. However, by offering categories instead of asking for specific details, especially with regards to income the response rate can be enhanced (De Vaus, 1996). It was also important to include a question asking about the general health of the household members, to ensure that conditions that would require special dietary requirements were identified. In these households the food consumption section may have been completed taking these dietary needs into consideration.

4.2.7 Pilot Study - Questionnaire Testing

A pilot study was carried out during October 1999 to test the questionnaire design and layout. The population used for the pilot was obtained from Brunswick School in the Woodseats area of Sheffield that, although it is situated outside the selected wards, was close enough to have a population of similar socio-economic background. The pilot sample was of 20 households and did not reveal any problems with the questionnaire content or layout. The only change to be made as a result of the pilot study was the method of questionnaire distribution. Initially a letter was sent out asking for participants and then questionnaires were sent directly to the home address. This gave a very low response rate and therefore it was decided to send the questionnaires home with each year 4 and year 5 pupil along with an explanatory covering letter.

4.3 Data Collection

The main phase of data collection commenced in November 1999 once the pilot data had been analysed and the necessary modifications to the questionnaire were made. As the methodological issues have been covered in the previous sections the remainder of this section will concentrate on the implementation of the collection phase, during which there were two main considerations:

- Enhance response rates
- Ensure quality of responses

4.3.1 Contacting the Schools

Details of all correspondence with the schools can be found in Appendix F. Once the schools which were willing to participate in the study had been identified a sample questionnaire and letter for the parents was sent to each headteacher for approval. No modifications were necessary and the headteacher's comments that were extremely encouraging.

A delivery date for the questionnaires was arranged at each of the schools. The number of pupils in year 4 and year 5 was obtained and the corresponding number of questionnaire packs was dropped off at each school on the pre-arranged date. The packs were given to the pupils to take home either on the day of delivery or within a day or two depending on other letters that were being sent home at that time. Some headteachers specifically stated that they would wait a while before distribution to avoid bombarding the parents with too many letters at one time.
As many of the schools had requested that their involvement in the study be as minimal as possible because of excessive workloads of the staff, the schools were only contacted once more for the distribution of reminder letters.

4.3.2 Contacting the Parents

The questionnaire packs that were sent home with year 4 and 5 pupils were the initial contact with the parents. The enclosed letter that was included with the questionnaire was used to

explain the nature of the study and why their schools had been targeted. A copy of this letter can be seen in Appendix G.

This letter was the only chance to gain the parents' interest and motivate them to complete the questionnaire, therefore they were assured of the importance of their reply and the confidentiality of any information given. A contact name and number was included for the research assistant co-ordinating the study, who was available to answer any queries which arose. No personal incentives were offered for the completion of the questionnaire.

4.3.3 Follow Up Letter

The parents were given two weeks to complete and return the questionnaire. A reminder letter was sent out to all the parents on the 18 January 2000. The purpose of this letter was twofold, firstly to thank those parents who had completed and returned the questionnaire for their support and interest in the research, and secondly to encourage parents who had not already returned the questionnaire to do so as soon as possible.

There are several reasons why the questionnaire may not have been returned by this point. Firstly the letter may not have been delivered to the parents by their child before Christmas; this is a particularly busy time of year and along with the other letters being sent home from school it may have been mislaid or lost. Secondly, the parents may not have had time to complete the questionnaire due to time constraints. As the pre Christmas period is an especially busy time for many households it is possible that people did not have the time to complete the questionnaire, or simply forgot about it in the run up to the festive season. As there was no way to identify which children's parents had already returned the questionnaire a letter was sent home with each child. Those who had already completed and returned the questionnaire were thanked for their co-operation and those who had not initially received a questionnaire were encouraged to telephone for a replacement to be sent to them.

4.4 Data Analysis

The quantitative data analysis was divided into two sections. First, the descriptive analysis which describes each of the variables and builds up the picture of what is happening in each of the households in terms of work and food behaviour. Second, the explanatory analysis where associations between the variables were tested and the effects of the intervening variables were explored. Through this exploratory analysis the hypotheses developed in section 3.2 were tested. In addition, the qualitative analyses of the comments from the main food provider about the management of food provision within the household. These results are used to support the quantitative data and highlight futher points for consideration.

4.4.1 Questionnaire Coding and Data Entry

The data from the questionnaire was coded using a template that was designed at the time of development. The appropriate codes were entered into Excel for Windows and the data set was checked for invalid entries. This process of cleaning the data was an essential step in the analysis phase to identify any values which had been entered incorrectly or miscoded. As two individuals were responsible for the data entry there was also an increased possibility for the data to be interpreted incorrectly, despite the use of a template. Once the data had been cleaned in this way, the files were transferred into SPSS 10.1 for Windows for analysis.

4.4.2 Initial Analysis

The main aim of the initial analysis was to explore the data set by building up a picture to describe the attributes of the study population and to look for any patterns which may emerge. Percentages and frequency distributions were obtained for each variable and where suitable histograms were used to observe the distribution.

For continuous variables, such as hours of work, the mean value for the population was obtained and the standard deviation was used to look at the dispersion. A large standard deviation, implied that there were considerable differences within the study population. For example, the

analysis of the food intake data (which is detailed in section 6.4) showed very large standard deviations for some food items, which implies that within the study population there are a wide range of intakes from those who consume very small amounts of the particular food to those who consume very large amounts. However, the standard error of the mean was also considered to determine whether the sample mean was representative.

For categorical data, such as the food and nutrition attitudes of the main food provider which were measured on a scale of one to five, the median value was considered. However, because of the extreme values recorded on some of the scales the median was not as appropriate in some cases. De Vaus (1996) suggests using the mean value in such cases. As many of the categorical variables were combined, especially those describing job satisfaction, nutrition knowledge and attitudes, the resulting scales could be treated as continuous data, and therefore the mean and standard deviation were more appropriate statistics to use.

4.4.3 Further Analysis

Further analysis was designed to look for any association between the variables and test the hypotheses. The first stage was to identify the variables which were to be used to test the hypotheses. The initial analysis, which was purely descriptive, was to describe the behavioural attributes and attitudes of the study population, and all of the questionnaire items were considered. At this stage only specific items were required, namely those which described the work, food and intervening variables and could be used to look for association. The variables identified at this stage are:

- The number of working hours for the main food provider and both adults combined
- Ability to work flexi-time
- Total job satisfaction and satisfaction with hours for the main food provider
- Food consumption for each of the food groups
- Other food consumption data; food component scores and convenience foods
- Household healthy eating score - relative healthiness of the diet based on COMA (1994) recommendations
- Total nutrition knowledge of the main food provider
- The attitudes of the main food provider towards food and nutrition
- The confidence in cooking skills of the main food provider

The nature of any associations which were found would also be explored at this stage to determine the strength and direction of association.

4.4.3.1 Statistical Analysis of Quantitative Data

Method	Type of Data	Statistical Tests
Crosstabulation	Categorical - data which can be organised into categories but for which there is no quantifiable difference between categories.	Chi Square Use Phi and Cramer's V test for significance
Correlation	Continuous - data which has natural ranking and differences between the values can be quantified; e.g. the number of hours worked per week	Pearson Correlation Coefficient Strong association when r>=0.3
Independent Sample t-test	Compare means between two groups of data e.g. knowledge scores between those with and without nutrition education	t-statistic
One Sample t-test	Compare mean of sample with selected criteria e.g. food intake with COMA recommendation	t-statistic
Paired Sample t-test	Compare means between two samples from same household e.g. job sat scores for MFP and adult 2	t-statistic
One-Way Analysis of Variance (ANOVA)	Continuous data - used to compare the means between three or more unrelated samples	F Statistic Post hoc - LSD and Tukey's HSD
Principal component analysis (factor analysis)	Continuous data - data reduction method. The variation within the data set is described in terms of a number of components (factors). Various selection criteria are used (see opposite) to identify an appropriate number of meaningful components.	KMO and Bartlett's test of Sphericity >=0.5 Varimax rotation Eigen Values >1

Table 4.1 Methods and Statistical Tests used for Analysis

Further analysis, beyond establishing association between the working patterns and food behaviour was designed to test for the interaction of job satisfaction, nutrition knowledge and attitudes to food and nutrition on any association. A correlation coefficient of at least 0.3 was used to indicate any strong significant association. Correlation coefficients much lower than this have been flagged as significant to the 0.01 and 0.05 level by SPSS. Due to the large sample size, these have been carefully examined to determine whether there may be a weak association or whether the results are likely to have occurred by anything other than chance.

4.4.4 Missing Data

The missing data has been dealt with in two ways. Firstly, in the descriptive analysis it has been counted and listed, but not taken into account for the calculation of percentages that show frequency distributions. Secondly, for variables where a composite score has been calculated missing values have been replaced by the mean or median value for each particular variable. This approach is advocated by de Vaus (1996) as it avoids any bias which may occur if the composite scores are not calculated from the same number of variables. The missing data from nutrition knowledge and attitudinal variables have been treated in this way.

Chapter 5 - Descriptive Analysis

5.1 Response Rates & Background Information

Using the background information from section E on the questionnaire, it was possible to develop an overview of the study population. Income, occupation, household composition, education and health are all used to develop a profile of the research participants. Although these variables are not directly involved in the hypothesised relationship between work and food behaviour (see Chapter three) they may act as confounders. As such, they will also be involved in the further analysis in Chapter six.

5.1.1 Response Rates

The initial distribution of the questionnaires, via the schools, took place during the first week of December 1999. The parents were given two weeks to complete and return the questionnaires, although a few were still returned after the Christmas period. A reminder letter was sent on the 18th January 2000 which was designed to reassure the parents that their replies would still be valid and useful for the study. It also aimed to encourage those who had not already received a copy to ask for one. The response rate following the initial contact with the parents was 20.4% (N=613). Following the reminder letter the sample size increased, and the final response rate was 21.4%. Although this response rate did not meet initial expectations, the quality of the replies was good and the majority of the returned questionnaires could be used for data analysis. As few respondents omitted questions completely, the amount of missing data was limited. In total only three replies were received that had been poorly completed or left blank and these were not included in the analysis. Further details of data collection and treatment of missing data are covered in Chapter 4.

5.1.2 Socio-economic Profile

The different types of household included in the study population are shown in Table 5.1. The majority of households were two adult, dual earner households. Only 14% of the total sample were single parent households, and of those only 20% (3% of total) were unemployed. The total unemployment within the sample is only 3.5% (including single parent and two parent households); it can be concluded that the sampling frame was successful in targeting households in employment.

	Frequency	Percentage of Total
Number of Households	642	-
Households in employment	*619*	*96%*
Single Parent Households	**92**	**14%**
Single Parent - Employed	*73*	*11%*
Single Parent - Unemployed	*19*	*3%*
Two Adult Households	**550**	**86%**
Two Adult - Single earner	*79*	*12%*
Two Adult - Unemployed	*4*	*0.7%*
Single Earner Households	**152**	**24%**
Dual Earner Households	**467**	**72%**

Table 5.1 Household type; shown as a percentage of the total sample

Note - % of total sample is shown in bold.

The socio-economic classifications were based on the occupations of the adults in the household. These groups were identified using the self-coded version of the National Statistics Socio-Economic Classification (NS-SEC), the development of which has been described by Martin and Deacon (ONS, 2000). Using the occupations given by the main food provider and other adult, each household was placed into one of nine categories. Where there was only one adult living in the household, their occupation was used to classify the household. In households with two adults, the occupation with the higher classification was used. The distribution for the whole sample can be seen in Table 5.2.

Occupational Groups	Frequency	Valid %
Senior managers and administrators	125	19.5%
Professional occupations	157	24.5%
Associate professionals	90	14%
Clerical and intermediate	77	12%
Shop occupations	24	3.7%
Skilled manual occupations	50	7.8%
Semi-skilled manual and service	65	10.1%
Routine manual and service work	29	4.5%
Unemployed, students and retired	23	3.6%
Not coded	2	0.3%

Table 5.2 Distribution of Occupational Groups

5.1.3 Household members

The sampling frame ensured that all households contained at least one child aged between 8 and 10 years and one adult. However, the most common household type contained two adults and two children, with 56% of the total sample being of this kind. Only 5.9% of households had more than two adults or more than three children. The breakdown of the number of adults and children within the household are shown in Table 5.3.

Adults in Household	Number of Children in Household									
	1		2		3		4		5	
1	20	6.3%	37	5.8%	11	1.7%	4	0.6%	-	-
2	63	9.8%	360	56.1%	89	13.9%	18	2.8%	3	0.5%
3	9	1.4%	11	1.7%	1	0.2%	2	0.3%	-	-
4	5	0.8%	5	0.8%	2	0.3%	1	0.25%	-	-
5	1	0.2%	-	-	-	-	-	-	-	-
N = 642										

Table 5.3 Number of adults and children in the household

5.1.3.1 The Main Food Provider

The main food provider was defined as the adult in the household who did the majority of the food shopping, food preparation and cooking. Each household was asked to identify the main food provider and this person was asked to complete the questionnaire. If responsibility for the above tasks was shared, then they were asked to nominate only one adult as the main food provider. The results were as follows;

- In 90% of all households that participated the main food provider was a woman.
- In all single parent households, except one, the main food provider was a woman.
- In dual earner, households 84% said that the main food provider was a woman.

5.1.4 Car Access

The majority of households had access to a car; only 7% stated that they did not own or have access to a car. Not owning a car may be a barrier to accessing large out of town supermarkets; but as the majority of the study population owned or had access to a car this was not a concern.

5.1.5 Income

The average total income for each household is shown in the graph opposite. This is the total gross income for both adults in the household. As the income bands are quite wide it is difficult to make accurate observations about the income within the population.

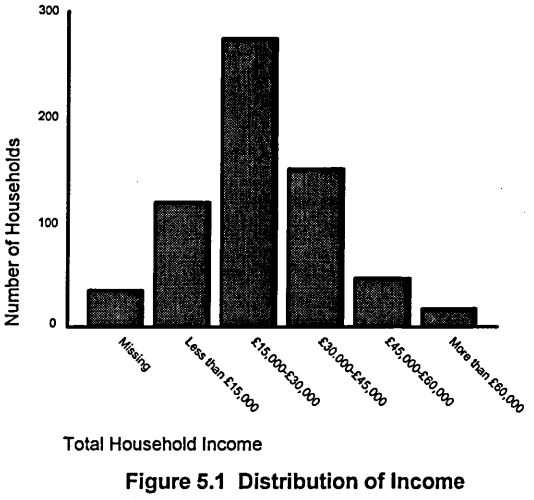


Figure 5.1 Distribution of Income

Estimation of the average income within the sample can be made using the middle value within each income band and multiplying it by the number of households within each category. Missing data is assigned to the median value. Thus the average income within the study population is approximately £26,285. In the UK average household income stands around £23,200 (CACI). The average household income for Sheffield is below the UK average at only £19,000 (CACI). However, because the sampling frame identified predominantly dual earner households certain groups within the population with lower incomes, such as the elderly and one person households, were excluded. Therefore, it was expected that the average income for the study population would be higher than the National and Sheffield averages. In addition there were a large number of professional and managerial occupations identified within the sample and these are also associated with a higher than average income.

5.1.6 Health

Only 4.5% of all respondents reported any health problems for themselves or other household members. Most commonly reported disorders are shown in Table 5.4. Although some of the health problems reported, such as diabetes, would significantly limit food choices or alter the food intake this was not taken into consideration when analysing the food consumption data for two reasons. Firstly, the number of households affected, as a percentage of the total sample, is very small. Secondly, total food consumption within the household was recorded and therefore any special dietary requirements of an individual can be viewed as being no different to individual likes and dislikes. This point is clearly illustrated by comment received from one household where the health problems are not the main determinant of food choices made within the household;

"Both children have insulin dependant diabetes therefore should have a low sugar, low fat high fibre diet. Main difficulties in preparing wholesome family meals revolve around the children's likes and dislikes - not related to their diabetes." (142)

Health Problem	N	% of population	Health Problem	N	% of population
Asthma	6	0.9%	Cardiovascular Diseases	3	0.45%
Diabetes	4	0.6%	Cancer	2	0.3%
Arthritis	3	0.45%	Other	11	1.7%

Table 5.4 Most common health disorders within the study population

As illustrated by the above quote the variation in total household food intake related to these health problems may be no more than that resulting from food likes and dislikes. Therefore, the households reporting health problems will not be considered separately in the analysis of the food consumption data in section 5.4.

5.1.7 Education

The main food provider was asked to state their highest level of education, the results are shown in Table 5.5.

Level of Education N=642		
	Frequency	Valid %
Secondary	281	44.2%
Further	145	22.8%
Higher	210	33%

Table 5.5 Education of Main Food Provider

5.1.8 Summary

- The most common household type within the study population consists of two working adults and two children (N=360).
- The households were of higher socio-economic status than the general population of Sheffield.
- The majority of the study population were generally in good health.
- A third of all the main food providers had been educated to university level.

5.2 Working Patterns of the Study Population

The analyses of the adults working patterns are given in this section, using data from questionnaire Part A. The type of employment, the number of hours committed to work, and the flexibility within these hours are presented for the main food provider and for the second adult. The working hours of both adults are also combined to give a household measure. The breakdown of household type based on employment is shown in section 5.1.1. Within the sample, 23 households were identified that were not in employment (see Table 5.2).

5.2.1 Time Committed to Work

The amount of time committed to work each week by the adults within each household was considered in two ways. Firstly, in terms of the *type of employment*, which may be associated with a standard number of hours; for example a minimum of 37 hours full time or maximum of 20 hours part time. Secondly, *the actual amount of time devoted to work activities each week*, which may differ substantially from contracted hours; for example due to paid or unpaid overtime. Time spent travelling to and from work can also contribute a substantial amount of time each week to work related activities; thus data on the amount of time spent travelling to and from work was also collected. However, during the analysis it became clear that the wording of the question was ambiguous; some respondents had recorded the amount of time per day whilst others had worked out the total time spent travelling each week. Due to this confusion this data has not been presented and will not be used for further analysis.

5.2.1.1 Employment Type

As the majority of main food providers are female, the employment rate for women within the sample is approximately 85% and 98% for men. This again gives a reason for the higher average income for survey respondents compared to the national average income. In the UK the average employment rate for women is 66.5%, across all age groups and education levels (Bower, 2000). This reinforces the suitability of the sampling frame in obtaining a study population with high employment. Table 5.6 shows the frequency distribution within the sample for the different employment types. 57% of the main food providers in employment worked part time, compared to only 5% part time employment for the other adult within the household. This is higher than the national average where 40% of women in permanent

employment work part time and 60% in full time employment (Bower, 2000). Self-employment only accounts for a very small percentage of employment for the main food provider, therefore it is more than likely that the majority of workers must conform to hours specified by their employer. The degree of flexibility and the amount of control the individual has on when these hours are worked will be considered later in this section.

Employment Type	Main Food Provider N=642	Valid %	Other Adult N=546	Valid %
Full time	152	24%	438	80%
Part time	351	55%	27	5%
Self Employed	30	5%	64	12%
Full time / Self Employed	0	-	8	1.5%
Part time / Self Employed	11	2%	1	0.2%
Unemployed	98	15%	11	2%

Table 5.6 Employment Type

5.2.1.2 Average number of hours worked per week

The average number of hours worked per week for the main food provider and the other adult are shown in Figure 5.2. The average weekly hours for the main food provider are positively skewed whilst those for the other adult follow a normal distribution. This may be accounted for by the greater number of part time hours worked by the main food provider (see Table 5.6). A paired sample t-test was used to confirm that within the households included in the study population the main food provider worked significantly fewer hours than the other adult.

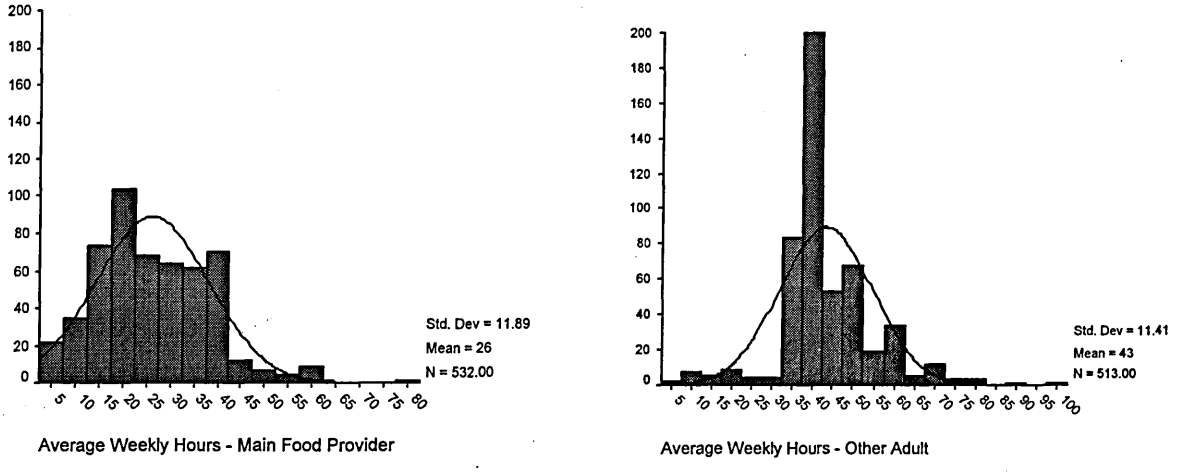


Figure 5.2 Average Weekly Hours worked by the Main Food Provider and the Other Adult

The working hours of the main food provider were also correlated with those of the other adult. There was a significant negative correlation (r=-0.197, p=0.000) between the two suggesting that if the main food provider worked longer hours their partner spent less time at work; or if the main food provider worked less their partner's hours increased.

5.2.1.3 Days and hours committed to work

The average amount of time spent in paid employment each week, within the sample, has been broken down and is shown in Table 5.7. Time is displayed as the number of days spent at work and the total number of hours worked per week, for the whole sample and for households where either one or both of the adults is employed.

	Whole Sample N=619		Single Earner N=152		Dual Earner N=467	
	Main Food Provider	*Other Adult*	*Main Food Provider*	*Other Adult*	*Main Food Provider*	*Other Adult*
Average no. of days per week	4 days	5.2 days	4.4 days	5.2 days	4 days	5.2 days
Average hours per week	26hrs	43hrs	26.2hrs	45.3hrs	26.1hrs	42.8hrs
Total Hrs per Household	*Mean = 56.34* *SD = 24.31*		*Mean = 36.71* *SD = 16.26*		*Mean = 66.12* *SD = 17.53*	

Table 5.7 Time committed to work each week

A paired sample t-test was used to determine whether there were any significant differences between the number of hours worked by the main food provider and other adult, in single and dual earner households. In both types of household the main food provider worked significantly fewer hours than the other adult. An independent sample t-test also confirmed that there was no significant difference in the hours worked by the main food provider in single or dual earner households. Thus, irrespective of whether the household had one or two adults working the main food provider spent on average the same amount of time at work each week.

5.2.2 Flexibility

Each adult was asked to provide information on their ability to work hours outside the "normal" working hours, (e.g. 9am - 5pm, Mon - Fri). They were asked to indicate whether they were able to work any of the types of working pattern listed in Table 5.8. They could tick all that were applicable. If this section of the questionnaire was left blank the missing data was interpreted as a negative response, e.g. there was no flexibility in the hours worked.

Flexi-time, shift work and working from home were the most common types of working pattern available to both adults. Working term time only was also popular for the main food provider but significantly less so for the other adult. Considering the sample as a whole, the availability of these types of working pattern was limited. This may suggest that there was little opportunity for individuals to manipulate their day to day working hours to take into account other household demands on their time. However, for further analysis only the ability to work flexi-time has been taken as an indicator of individual control over working hours. Shift work has been used to represent patterns of work outside the "normal" working hours.

	Main Food Provider N = 544		Other Adult N = 550	
	Frequency	% Valid	Frequency	%Valid
Flexi-time	96	15%	67	13%
Job share	42	6.5%	3	0.6%
Term time	114	17.8%	35	7%
Annual hours	31	4.8%	42	8%
Work from home	75	11.7%	85	17%
Shift work	73	11.4%	75	15%

Table 5.8 Patterns of Work

5.2.3 Job Satisfaction

The results are given for each of the 15 job satisfaction items for both adults: see Table 5.9. The items were measured on a Likert scale with scores ranging from 1-7, lower scores indicating less satisfaction with each particular aspect of work. The items were also added to give a total job satisfaction score, the frequency distributions of which are shown in Figure 5.3.

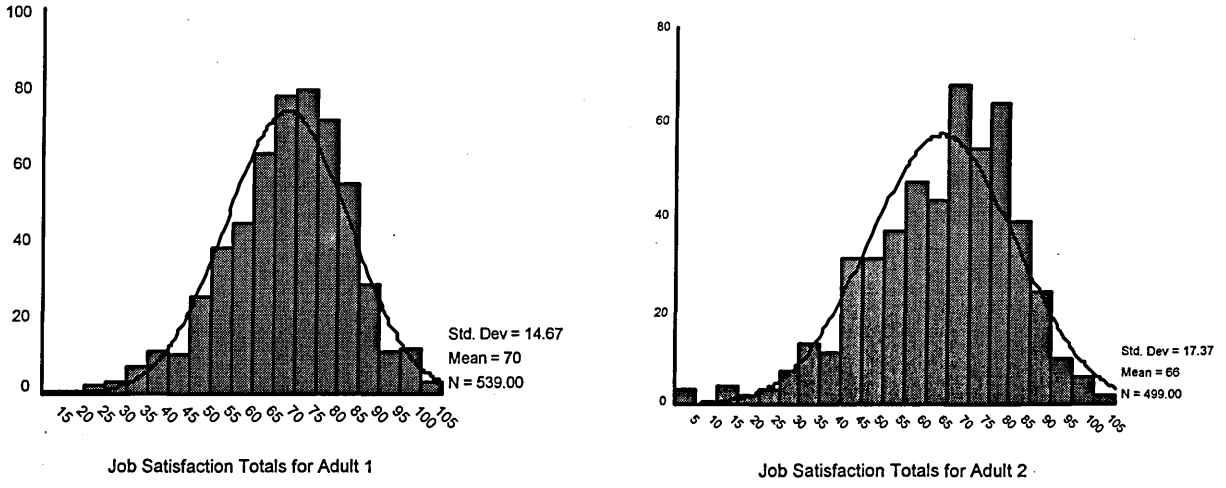


Figure 5.3 Distribution of Job Satisfaction Totals for Main Food Provider and Other Adult

In addition, job satisfaction has also been considered in terms of autonomy, feedback, work environment and reward. The scores for each of these elements, were calculated from a composite score of each job satisfaction item; these are also shown in Table 5.10. The distribution of job satisfaction totals for both adults are displayed in Figure 5.3 below. A paired sample t-test revealed that the main food provider had a significantly higher (p=0.01) total job satisfaction score than the other adult.

	Main Food Provider	Other Adult	t	p 2 tail sig.
AUTONOMY	***20.39***	***19.33***	***4.154***	***0.000****
Freedom to choose own method of working	5.21	5.14	0.900	0.369
Amount of responsibility	5.08	4.93	1.438	0.151
Opportunity to use abilities	4.98	4.94	0.150	0.881
Hours of work	5.13	4.32	8.224	0.000**
FEEDBACK	***18.08***	***16.71***	***3.488***	***0.001****
Recognition for good work	4.40	4.21	2.154	0.032*
Immediate boss	4.72	4.13	3.885	0.000**
Relations with management	4.53	4.23	2.387	0.017*
Attention paid to suggestions	4.44	4.14	2.672	0.008**
ENVIRONMENT	***19.57***	***18.14***	***5.172***	***0.000****
Physical working conditions	5.10	4.70	5.282	0.000**
Fellow workers	5.41	5.00	4.018	0.000**
Way the organisation is managed	3.87	3.54	2.874	0.004**
Amount of variety in job	5.19	4.91	2.103	0.036*
REWARD	***12.53***	***11.94***	***1.872***	***0.062****
Rate of pay	4.05	3.98	0.021	0.983
Chance of promotion	3.60	3.47	0.734	0.464
Job security	4.88	4.49	3.598	0.000**

** *significant at the 0.01 level (2-tailed)*

* *significant at the 0.05 level (2-tailed)*

Table 5.9 Mean Scores for Job Satisfaction: Autonomy, Feedback, Environment and Reward

5.2.4 Hours of Work and Flexibility

An independent samples t-test was performed to determine whether there were any significant differences in the average number of hours worked per week for those who had no flexibility and those who could work flexi-time. For the main food provider no significant differences were found but for the other adult those who were able to work flexi-time worked significantly fewer hours per week (p=0.01).

5.2.5 Hours of Work and Job Satisfaction

The correlation coefficients for working hours and job satisfaction for the main food provider, the other adult and total household values; the results are shown in Table 5.10.

		Hours Worked per Week		
		Main Food Provider	Other Adult	Total Household
Job Satisfaction	*Pearson Correlation*	**-0.090***	**0.156****	0.046
Main Food Provider	*Sig. (2-tailed)*	**0.040**	**0.001**	0.291
	N	**524**	**436**	533
Job Satisfaction	*Pearson Correlation*	-0.056	-0.062	-0.040
Adult 2	*Sig. (2-tailed)*	0.255	0.176	0.375
	N	419	476	493

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 5.10 Correlation Matrix for Number of Hours Worked per Week and Job Satisfaction

There was a positive correlation (r=0.156) between the job satisfaction of the main food provider and the hours of the other adult in the household. This association suggests that the main food provider becomes more satisfied with their job when the other adult in the household work longer hours. Is this related to the negative correlation between the working hours of the two adults shown in section 5.2.1.2? One explanation could be that as the working hours of adult 2 increase the main food provider's job satisfaction increases because they are working, or need to work, fewer hours. This appears to be confirmed by the negative correlation (r=-0.09) between the main food provider's job satisfaction and working hours. Although the correlation coefficient for this negative association is small and could have occurred purely by chance its direction does support the correlation for working hours.

5.2.6 Summary

- Over half of all women in employment work part time, compared to only 5% of men
- On average, the MFP works four days per week and a total of 26 hours per week.
- The percentage of those who work could work flexi-time was similar for both adults, but was slightly higher for the main food provider.
- Levels of job satisfaction were significantly higher for the main food provider and showed negative correlation with their working hours.

5.3 Providing Food for the Family

The food provisioning activities within the household are presented in this section; described by food shopping, food preparation and eating patterns. Each of these is considered in turn and then broken down into the variables that will be used for further analysis in chapter six. Also in this section the main sources of help within the home are examined, an important factor when thinking about the support available for individuals to manage their work and household responsibilities.

5.3.1 Food Shopping Patterns

The food shopping patterns for each household were identified using data on the number of food shopping trips per week, when these shopping trips were carried out and the division of responsibility for food shopping. Using this information combinations have been identified based on the time spent and division of labour for food shopping and food preparation within the household.

5.3.1.1 Number of food shopping trips per week

The main food provider was asked to estimate the average number of times per week that the main food shopping and any top up food shopping was carried out. The majority of respondents did their main food shopping just once a week. However, top up food shopping was done more frequently, either once, twice or three times per week - see Table 5.11.

5.3.1.2 When the food shopping is done

The next item for consideration was when these shopping trips actually took place. To examine the way in which individuals manage their work commitments and food provision for the household it was necessary to establish when the shopping trips were made. The main food provider was asked to indicate when the main and top up food shopping was done - they could tick as many of the boxes as were appropriate. The results are given in Table 5.12 and show the percentage of the total sample that indicated that they did at least some of their food shopping at these particular times.

N = 642	Main Food Shopping		Top Up Shopping	
	Frequency	*Valid %*	*Frequency*	*Valid %*
Never	6	1.1	40	7.4
Fortnightly or less	20	3.6	1	0.2
Once a week	481	86.4	163	30
Twice a week	38	6.8	174	32
Three times a week	8	1.4	93	17.1
Four times a week	1	0.2	45	8.3
Five times a week	3	0.5	14	2.6
Six times a week	-	-	8	1.5
Seven times a week	-	-	5	0.9
Total	**557**	**100%**	**543**	**100%**
Missing	**85**		**99**	

Table 5.11 Number of shopping trips per week.

N = 642	Daytime 8am-5pm	Evening 5pm-9pm	Night After 9pm	Wkday Mon-Fri	Sat'day	Sunday	Way home from wk	Work Break
Main Shopping	54.4%	25.9%	2.5%	52.4%	31.2%	15%	13.1%	5.3%
Top Up Shopping	47.3%	24%	3.1%	40.1%	24.8%	14.2%	31.8%	12.6%

Table 5.12 Breakdown of Food Shopping during the Week

Note - the percentages in this table do not total 100% as they only represent the percentage of the total sample that did at least some their food shopping at these particular times. Respondents could tick as many boxes as were appropriate.

The results in Table 5.12 show that the most popular time for the main food shopping to be done is on a weekday during daytime hours (8am-5pm). Saturday comes second (31.2%) and 15% of respondents took the opportunity to do their food shopping on a Sunday. The top up food shopping is usually carried out at similar times, but in addition work breaks and shopping on the way home from work were also popular times.

It should be noted that the number of opportunities to shop during the week is more than at the weekend; five days during the week compared to only two at the weekend. Therefore, the percentage of respondents shopping on either Saturday or Sunday becomes more noteworthy as these values represent main food shopping being carried out on these days only.

5.3.1.3 Responsibility for Food Shopping

The main food provider was asked to indicate which adults did the main food shopping and top up food shopping each week. This data was crosstabulated; the results shown in Table 5.13.

	Main Food Shopping			Top Up Food Shopping		
Other Adult	***Main Food Provider***			***Main Food Provider***		
	Never	**Sometimes**	**Always**	**Never**	**Sometimes**	**Always**
Never	14	3	282	54	10	216
Sometimes	1	66	179	18	164	142
Always	12	21	64	16	10	12
Column Totals	*27*	*90*	*525*	*88*	*194*	*370*

Table 5.13 Main Food Shopping and Top Up Food Shopping patterns for the main food provider and other adult

From these results five combinations have been identified for main and top up food shopping patterns, these are outlined in Table 5.14. These combinations were identified using the cells with the highest frequencies and combining cells with a low count.

Main Food Shopping Combinations N=642	**Frequency**	**Percentage**
1. Main food provider always alone.	282	44%
2. Main food provider always, sometimes with Adult 2.	179	28%
3. Always both adults.	64	10%
4. Sometimes main food provider, sometimes Adult 2.	66	10%
5. Other combination.	51	8%
Top Up Food Shopping Combinations N=642	**Frequency**	**Percentage**
1. Main food provider always alone.	216	34%
2. Main food provider always, sometimes with Adult 2.	142	22%
3. Sometimes main food provider, sometimes Adult 2.	164	26%
4. Other combination.	66	10%
5. Never do top up food shopping.	54	8%

Table 5.14 Main Food Shopping Combinations

For the purposes of this research, these have been used to describe the division of labour relating to food shopping responsibilities within the household. For the further analysis in

Chapter 6 categories, three and four for main food shopping have been combined to describe those who share responsibility within the household.

5.3.1.4 Time Spent Food Shopping

The main food provider was asked to estimate how much time in total was spent shopping for food each week - all main and top up food shopping trips were to be included. The majority of households spent between one and three hours food shopping per week, with more people spending 1-2 hours per week rather than 2-3 hours. This may seem a small amount of time when viewed across the whole week but it is suspected that these estimates fall short of the actual time spent, as travelling time to and from the shops was not specifically asked to be included. These four groups are used in Chapter 6 to describe the time spent in all food shopping activities each week per household.

Estimated Time Spent Food Shopping per Week N=642		
Time	Number of Households	Percentage
1 hour or less	23	4%
Between 1 and 2 hours	271	42%
Between 2 and 3 hours	238	37%
More than 3 hours	110	17%

Table 5.15 Estimated time spent food shopping each week

5.3.2 Food Preparation

Household food preparation was considered in terms of division of labour between the adults, and the time spent on food preparation activities. It was also important to investigate whether there were any differences in the division of labour, during the week and at the weekend as working commitments will differ significantly at these times.

5.3.2.1 Division of labour

The same crosstabulation was performed for the food preparation data that had previously been carried out on the food shopping data. The missing data was assigned to the never category; the results are shown in Table 5.16. Using these results, five combinations have been identified for food preparation during the week and at the weekend.

Other Adult	Food Preparation during Week			Food Preparation at the Weekend		
	Main Food Provider			Main Food Provider		
	Never	Sometimes	Always	Never	Sometimes	Always
Never	7	6	293	41	7	181
Sometimes	-	125	166	17	206	142
Always	18	15	12	17	19	12
Column Totals	*25*	*146*	*471*	*75*	*232*	*335*

Table 5.16 Food preparation patterns for main food provider and other adult

The most common combinations, which show the division of food preparation within the household, are shown in Table 5.17. This table shows that there is a more equal distribution of household food preparation at the weekend when the work commitments for both adults are reduced; this is explored in detail in chapter six.

	Food Preparation during the Week	Frequency	Percentage
1.	Main food provider always alone.	293	45%
2.	Always main food provider, sometimes with Adult 2.	166	26%
3.	Sometimes main food provider, sometimes Adult 2.	125	20%
4.	Always Adult 2, main food provider less often.	45	7%
5.	Other combination.	13	2%
	Food Preparation at the Weekend	**Frequency**	**Percentage**
1.	Main food provider always alone.	181	28%
2.	Always main food provider, sometimes with Adult 2.	142	22%
3.	Sometimes main food provider, sometimes Adult 2.	206	32%
4.	Always Adult 2, main food provider less often.	48	8%
5.	Other combination.	65	10%

Table 5.17 Food Preparation Combinations

5.3.2.2 Time taken to prepare the family meal

Figure 5.3 below shows the average estimated time taken to prepare the main family meal during the week and at the weekend. An independent sample t-test confirms that there is a significant difference between the two; with the time spent during the week being less than that at the weekend. There are a number of possible explanations for this, one of which could be the greater time available at the weekends due to fewer work commitments.

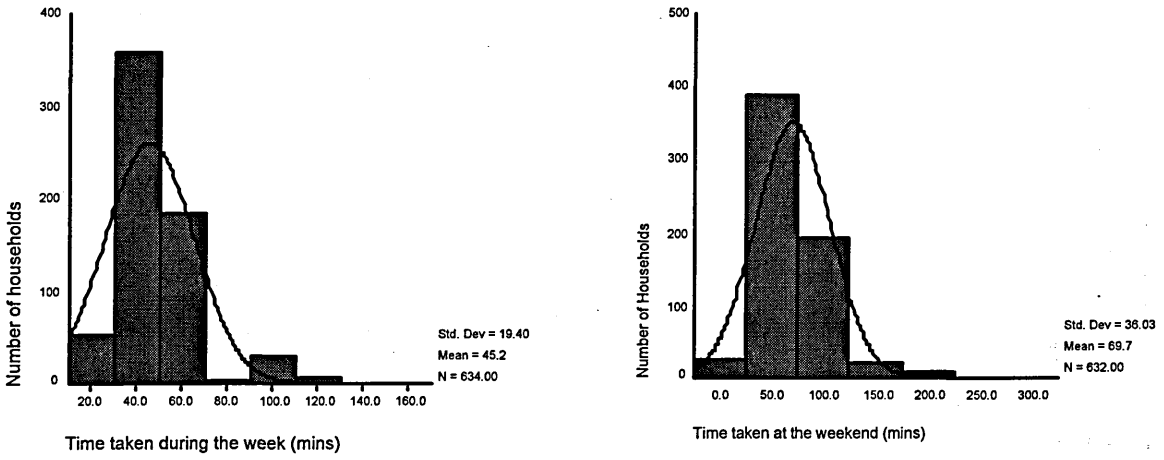


Figure 5.4 Average time taken to prepare the main family meal

The time spent in food preparation has been split into three groups which will be used for further analysis in Chapter 6; see Table 5.18.

Time Spent in Food Preparation					
During the Week	**Frequency**	**Percentage**	**At the Weekend**	**Frequency**	**Percentage**
Less than 30 mins	259	40%	Less than 60 mins	410	64%
30-60 mins	335	52%	60-90 mins	107	17%
More than 60 mins	48	8%	More than 90 mins	125	19%

Table 5.18 Estimated time spent in food preparation each week

5.3.3 Eating Patterns

It is important to consider a number of different eating patterns which could be seen as time saving strategies or adaptations to the time available for food provision within the household. Apart from the use of convenience foods, which is discussed in section 5.4, the use of take-away foods and eating out are alternatives to food provision within the home. Also there is concern over the development of fragmented eating patterns, grazing, snacking and the move away from eating meals with all family members together. In addition, children's lunchtime eating habits during term time are considered.

5.3.3.1 Take-away and Eating Out

The use of take-away food and eating out is shown in Table 5.19. The distribution shows that households most frequently have take-away food and eat out once a month.

N=642	Take Away				Eating Out			
	During Week		Weekends		During Week		Weekends	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Never	144	22%	145	22%	210	33%	111	17%
Less than 1 a month	248	38%	274	43%	336	52%	384	60%
2-3 times a month	127	20%	136	21%	76	12%	124	19%
Once a week	115	18%	81	13%	18	2.8%	21	3%
More than 1 a week	8	2%	6	1%	2	0.3%	2	0.3%

Table 5.19 Take-away and Eating out during the week and at the weekend

Note: The missing data has been included in the "never" category and it has been assumed that a non-response means the use of take-away foods and eating out do not occur in those particular households.

Use of take-away and eating out as a family during the week and at the weekends could be seen as a time saving strategy. There are many different reasons why food preparation within the household may be avoided, by relying on take-away foods and eating out, other than due to time constraints. Take-away foods and eating out is often considered a "treat" as there is no food preparation or clearing away to be done. In all categories, except one, the use of take-away and eating out occurs more frequently at the weekend compared to during the week. The only category where this is not the case is the use of take-away once a week where frequency during the week is slightly higher than that at the weekends. However, there is no significant difference between weekday and weekend consumption of take-away and eating out for all categories. This would suggest that eating take-away foods and eating out are not used as regular time saving strategies but more as occasional treats and indulgences. As there is a significant difference between the time spent in food preparation during the week and at the weekend, one would have expected a similar trend here, with greater consumption during the week, if their use were time saving.

5.3.3.2 Main meal - eating patterns

The eating patterns of the household members have been considered during the week and at the weekend, and the results can be found in Table 5.20. During the week, most children eat with one or more of the adults. Children eat alone more frequently during the week than at the weekend, when there seem to be more meals eaten with all members of the household present. This could a reflect the reduced work commitments and the preparation of special meals, such as the Sunday roast.

	Eating Patterns					
	During the Week			At the Weekend		
	Never	Sometimes	Always	Never	Sometimes	Always
Eating Together	150	310	182	83	211	348
1 Adult + Children	232	289	121	379	202	61
Children Alone	340	276	26	444	192	6
Adults Alone	325	282	35	406	226	10

Table 5.20 Household eating patterns during the week and at the weekend

5.3.3.3 Children's Lunch

Information about the type of lunch the children usually have during term time was collected; the different meal types are shown in Table 5.21.

Type of Lunch N=635	Frequency	%
School meal	140	22%
Packed lunch	305	48%
Eat at home	4	0.6%
Packed lunch or school meal	170	26.8%
Packed lunch or buy own food	9	1.4%
Other	7	1.1%

Table 5.21 Children's lunch during term time

The most popular lunch types were school meals and packed lunches. It must be noted that these results do not show the breakdown for each particular school involved in the project and there may be some schools which do not offer cooked meals, therefore the figures for packed lunches may be higher than if the pupils had a choice.

5.3.4 Help in the Home

The final part Section B on the questionnaire asked the main food provider whether they had any paid or unpaid help within the home. 11.5% of all households said they had some form of paid help within the home, whilst 23% said that they received regular help from an unpaid source. The most common type of paid help received within the home was from a cleaner, on average working 7 hours per week. The most common types of unpaid help received were in childcare and cleaning, mostly from family members who gave on average 9 hours per week.

5.3.5 Summary

- The main food shopping is carried out most frequently once a week and supplemented by 1-3 top up food shops throughout the week.
- The main food provider is predominantly responsible for food shopping with some support from other adult. Responsibility is shared more equally when considering top up shopping alone.
- On average between 1-3 hours per week is spent on all food shopping trips.
- The main food provider is responsible for most food preparation, during the week and at the weekend, but other adult has greater involvement at the weekend.
- More time is spent preparing the main meal at the weekend.

5.4 Household Food Consumption

The household food consumption data has been compiled from the food frequency section on questionnaire. The main food provider was asked to complete this section, considering the intake of the household as a whole, disregarding individual food preference. Thus, an average intake per person for each food item was estimated. This data was entered into SPSS in two formats; firstly as an approximate number of portions per week and secondly as a simple representation of the frequency of intake.

5.4.1 Interpretation of the Food Consumption Data

The interpretation of the food consumption data will differ depending whether it is being considered in terms of the number of portions or the frequency of intake. The former has been used to make quantitative comparisons with existing recommendations on food intake and the balance of foods within the diet. The latter has been used to identify trends within the study population based on the variation in frequency of consumption.

5.4.1.1 Number of Portions

The intake for each food item was entered into SPSS as approximate number of portions per week. The equivalent number of portions for each category can be seen in Table 5.22. The portion size was assumed appropriate and constant for each particular food item. This data was used to make comparisons with the COMA (1994) recommendations, which are given as an ideal number of portions per week, and with The Balance of Good Health, which shows the proportion in which food should be consumed; the actual portion size was unimportant. Thus, the food consumption data entered in this format resulted in a total number of portions per week, which was used to make comparisons with current dietary recommendations and guidelines on food group intakes and proportion within the diet.

FOODS	HOW OFTEN FOODS ARE EATEN BY FAMILY							
	Never or Rarely	1-3 a month	Once a week	2-4 per week	5-6 per week	Once a day	2-4 per day	5 or more per day
BREAD								
Equivalent portions	*0*	*0.5*	*1*	*2*	*5*	*7*	*21*	*35*

Table 5.22 Food consumption data as number of portions per week

5.4.1.2 Frequency of Intake

The food consumption data was also entered simply as a number to represent the frequency of intake. The values for each category can be seen in Table 5.23.

FOODS	HOW OFTEN FOODS ARE EATEN BY FAMILY							
	Never or Rarely	1-3 a month	Once a week	2-4 per week	5-6 per week	Once a day	2-4 per day	5 or more per day
BREAD								
Frequency of intake	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*

Table 5.23 Food Consumption Data as a Simple Representation of Frequency

Principal component analysis was applied to the data entered in this format; this identified groups of foods, which were used to explain some of the variation in consumption within the sample. As principal component analysis is a data reduction method, the components that were identified were used to describe patterns of food consumption rather than the fifty individual food items. The advantage of this is that the data becomes much simpler to interpret especially when associations between working patterns, food provision, knowledge and attitudes are being explored - see Chapter 6.

5.4.2 Total Number of Food Portions Consumed

The 1994 COMA report on the Nutritional Aspects of Cardiovascular Disease made a number of dietary recommendations for the intake of certain foods. This was represented in the report as an illustrative example of changes to the National Food Survey results, if COMA's recommendations were met - see Appendix H. The figures given in the report represented national averages for household food consumption and not individual intakes. Therefore, the food consumption data from the questionnaire can be compared with these values, as the intake was given as a household average and not as an individual intake.

The COMA report makes recommendations about the intake of starchy foods, fruit and vegetables, milk and dairy products, meat and meat products, fish, fats spreads and oils, fibre and sweet foods. The results are given for the household intake of each of these types of food and considered in the light of current healthy eating messages. The average weekly intake per household and the recommended COMA intake, for each food group, in terms of the number of portions consumed per person per week are given in the sections below.

5.4.2.1 Starchy Foods

In line with the COMA recommendations of 1994 and current healthy eating guidelines issued by MAFF, carbohydrate consumption should be increased to provide at least 50% of total energy intake. In order to achieve this, an increase in the consumption of starchy foods is necessary. The COMA report recommended a 50% increase in the intake at that time to 4 slices of bread and 2 portions of rice, pasta or potatoes per day. The proportion of wholemeal to white bread has also been considered in the analysis, as this is important when the amount of carbohydrate rich foods containing whole grains which is now seen to be important for the prevention of gastro-intestinal cancers and coronary heart disease (MAFF, 1995b).

Note: Intakes per average household member per week	Household Intake	COMA Recommendations	t	p sig 2-tail
Total intake of carbohydrate rich foods	Mean = 39 portions SD = 22, SE = 0.88	53.5 portions	-15.99	0.00
Total bread intake	Mean = 15.5 portions SD = 12, SE = 0.48	31.5 portions	-33.21	0.00
Proportion of wholemeal to white bread	Mean = 0.31 SD = 0.29, SE = 0.01	0.5	-16.74	0.00
Intake of pasta and rice	Mean = 3.2 SD = 3.6, SE = 0.14	7 portions	-26.61	0.00
Intake of breakfast cereal	Mean = 14 SD = 12, SE = 0.48	7 portions	14.56	0.00
Intake of potatoes	Mean = 4.1 SD = 4.3, SE = 0.20	7 portions	-17.00	0.00
Intake of potato products and chips	Mean = 2.5 SD = 2.3, SE = 0.09	1 portion	15.69	0.00

Table 5.24 Intake of carbohydrate rich foods

As the results in Table 5.24 show, the mean intake of starchy foods for the study population falls below the COMA recommendations, but the standard deviation for the sample is large. This indicates that there will be households with much lower than average intakes which fall well short of the recommended intakes, and households with much higher intakes who meet, or even exceed the COMA values.

The mean intakes for bread, rice and pasta, and potatoes fall below the COMA recommendations whilst those for breakfast cereals, and potato products and chips are above the

recommended intakes. The proportion of wholemeal to white bread also fails to meet the recommendations, with more white bread being consumed.

5.4.2.2 Milk and Dairy Foods

The main change highlighted for this food group is the switch from high fat to low fat varieties of milk and dairy products. Recent food survey data shows that the trend continues for choosing semi-skimmed rather than full cream milk, with additional increases in the consumption of skimmed. However, the consumption of cream has continued to rise which is contrary to the low fat messages on healthy eating (NFS 1998). The results for the study population are shown in Table 5.25.

Note: Intakes per average household member per week	Household Intake	COMA Recommendations	t	p sig 2-tail
Total intake dairy products	Mean = 24.5 SD = 13.07, SE = 0.52	16.5 portions	13.77	0.00
Total milk intake	Mean = 19 SD = 10, SE = 0.54	11 portions	20.01	0.00
Total cream intake	Mean = 0.85 SD = 3, SE = 0.13	3.5 portions	-20.18	0.00
Total cheese intake	Mean = 4.4 SD = 7, SE = 0.27	2 portions	9.01	0.00
Proportion of low fat to high fat dairy products	Mean = 0.5 SD = 0.3, SE = 0.02	0.3	8.91	0.00

Table 5.25 Intake of milk and dairy products

The mean intake for milk and dairy products within the study population is higher than the COMA recommendation of 16.5 portions per week. The standard deviation is again high and this indicates that there are extremes within the range of intakes. However, the mean intake of cream is low and the proportion of low fat to high fat dairy products (which is based on cheese and yoghurt) is higher than COMA recommendations, which suggests that the study population on average, is choosing lower fat varieties of milk and dairy products. The main food provider was also asked to indicate which types of milk were used within the household. 35% of the total population used full cream milk, 71% semi-skimmed and 17% skimmed milk, but in some households, more than one type of milk was used. The most common combinations of milk used were semi-skimmed with full cream for the children, or semi-skimmed with skimmed for the adults.

5.4.2.3 Fruit and Vegetables

When the COMA recommendations are used to calculate the amount of fruit and vegetables to be consumed the total is 42 portions per week. However, current public health messages indicate that intake should be in the region of 35 portions per week (calculated from 5 portions per day). Therefore, when comparing the population intake with the recommendations a value that falls between the two was taken as acceptable for meeting the recommendations. The results are shown in Table 5.26.

Note: Intakes per average household member per week	Household Intake	COMA Recommendations	t	p sig 2-tail
Total intake of fruit and vegetables	Mean = 36.6 portions SD = 24.31, SE = 0.96	35-42 portions	1.72	0.086
Total intake of fruit	Mean = 21.1 SD = 15.08, SE = 0.55	14 portions	11.90	0.00
Total intake of vegetables	Mean = 15.6 portions SD = 13.98, SE = 0.60	28 portions	-22.53	0.00

Table 5.26 Intake of fruit and vegetables

The mean intake for all portions of fruit and vegetables for the study population falls within the recommended range, but once again as the standard deviation is very high this also means that there are households within the population whose intake fall well below the recommendations.

5.4.2.4 Meat and Fish

The average intake for meat and meat products are lower than the COMA recommendations, but the average intake of fish and oily fish shows good compliance.

Note: Intakes per average household member per week	Household Intake	COMA Recommendations	t	p sig 2-tail
Total intake of meat and meat products	Mean = 3.8 portions SD = 3.48, SE = 0.31	8.5 portions	-34.44	0.00
Total intake of poultry	Mean = 1.95 SD = 2.0, SE = 0.08	3 portions	-13.39	0.00
Total intake of all fish	Mean = 1.9 portions SD = 1.48, SE = 0.06	2 portions	-1.03	0.305
Total intake of oily fish	Mean = 1.0 portion SD = 1.1, SE = 0.04	1 portion	1.095	0.274
Total egg intake	Mean = 2.8 egg SD = 3.8, SE = 0.15	1 egg	9.03	0.00

Table 5.27 Intake of meat and fish

5.4.2.5 Sugary and Fatty Foods

The COMA recommendation for this group of foods may seem quite high but this does not equate to the physical amount of food consumed in terms of weight. Compared with a portion of pasta for example, a portion of jam is much smaller, therefore the number of portions is higher than in some other food groups.

Note: Intakes per average household member per week	Household Intake	COMA Recommendations	t	p sig 2-tail
Total intake of high fat foods, sugary foods and sweets	Mean = 51 portions SD = 32, SE = 1.27	52 portions	-0.725	0.469

Table 5.28 Intake of sugary and fatty foods

The average intakes for sweet and fatty foods are slightly lower than the COMA recommendations but not significantly different.

5.4.3 Food Group Consumption

The food items were divided into the food groups that appear on The Balance of Good Health - see Appendix B. Most food items were easily assigned to an appropriate group, however some items were more difficult. For example, it was decided that full fat dairy products should count towards the intake of milk and dairy products as well as fatty foods. Making this distinction allows for differentiation between the intakes of high and low fat products which is an important distinction especially when using the food group scores to develop a measure of healthy eating.

5.4.3.1 Food Group Intakes

The data for the number of portions consumed per week for each food item, was converted into a total number of portions consumed, per week, for each of the five food groups. Each item on the food frequency list contributes to the total intake for at least one of the food groups. Some food items contributed to more than one of the total scores, for example, full fat yoghurt and full fat cheese will be counted in both the dairy products and fatty foods groups. A list of the food groups and the food items that contribute to their total score is given in Table 5.29.

FOOD GROUPS				
Bread, Cereals and Potatoes	**Fruit and Vegetables**	**Dairy Products**	**Meat, Fish and Alternatives**	**Sugary and Fatty Foods**
White bread	Fresh fruit	Milk	Pulses	Sugar coated cereals
Wholemeal bread	Tinned fruit	Full fat yoghurt	Baked Beans	Cream
Plain cereals	Stewed fruit	Full fat cheese	Meat	Butter & margarine
Sugar coated cereals	Dried fruit	Reduced fat yoghurt	Poultry	Full fat yoghurt
High fibre cereals	Fresh vegetables	Reduced fat cheese	White fish	Full fat cheese
Potatoes - plain	Frozen vegetables	Eggs	Oily fish	Chips
Chips or roast potato	Salad	Creamy sauces	Meat pies	Potato products
Potato products	Tinned vegetables	Pizza	Burgers/sausages meat	Creamy sauces
Rice	Tomato based sauces	Puddings	Burgers/sausages veggie	Jam, honey, sweet spreads
Pasta	Vegetable pies		Cold cooked meats	Meat pies
Pizza	Pizza		Pizza	Veggie pies
	Pure fruit juice			Cold cooked meats
				Potato crisps
				sweet biscuits
				Cakes, pies and pastries
				Puddings
				Sweets

Table 5.29 Food Groups - using food items from questionnaire

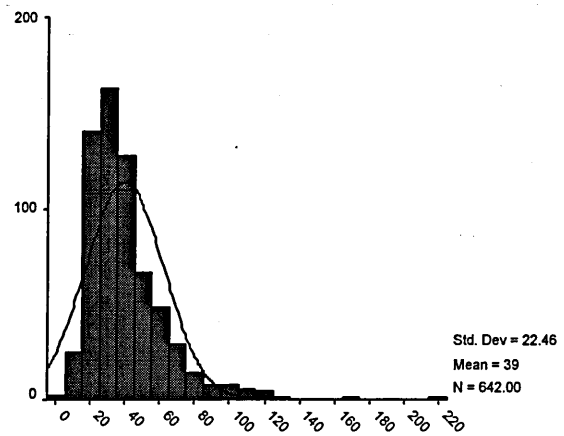
The distribution for the household intakes of each of the food groups, given in terms of the number of portions consumed per week, is shown in Figure 5.4.

5.4.4 Developing a Measure of Healthy Eating

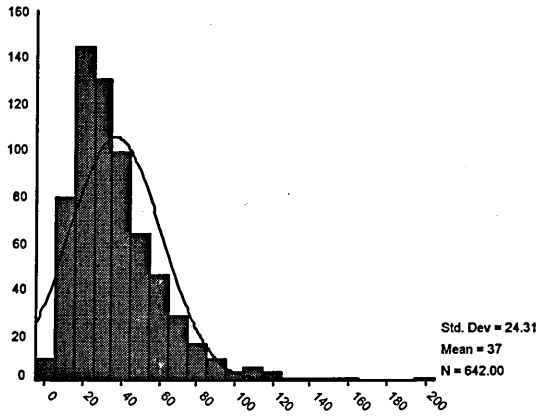
A measure of healthy eating was developed on which each household could be measured. Two methods were used, both of which are detailed below. The healthy eating score for each household is used in Chapter 7 to determine whether an association exists between working patterns, nutrition knowledge and attitudes and the consumption of a healthy diet.

5.4.4.1 Developing a Measure of Healthy Eating using The Balance of Good Health

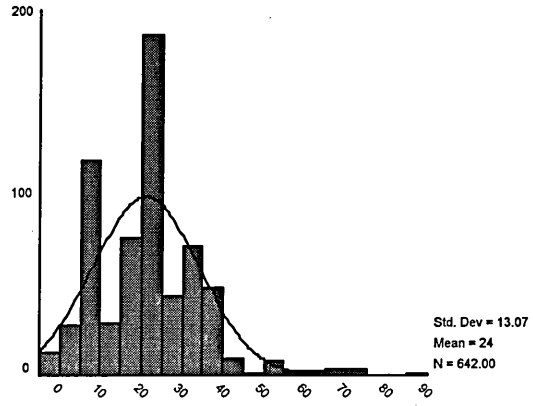
The principle behind The Balance of Good Health is that the five main food groups are represented in the ideal proportions in which they should be consumed for good health; for example, fruit and vegetables should account for one third of our total dietary intake.



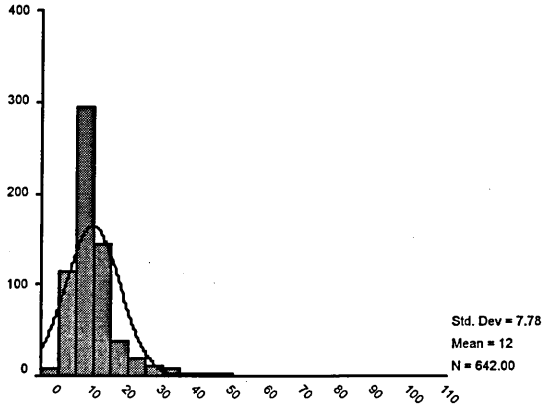
Starchy Foods



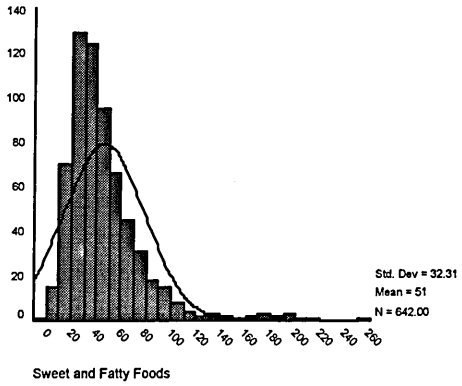
Fruit and Vegetables



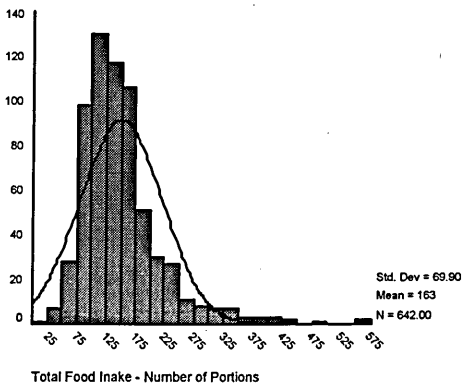
DAIRY



Meat and Fish



Sweet and Fatty Foods



Total Food Inake - Number of Portions

Figure 5.5 Frequency Distribution for Food Groups using Food Portion Intakes

The proportions on the Balance of Good Health plate are divided as follows:

Food Group	% of total plate surface area
Fruit and vegetables	33%
Bread, Cereals and Starchy Foods	33%
Dairy Products	12%
Meat, Fish and Alternatives	15%
Sugary and Fatty Foods	8%
Total	**101%**

Table 5.30 - The sum of 101% results from rounding of the individual values.
(Adapted from Gatenby, *et al*, 1995)

The total intake for each food group was calculated in section 5.4.3.1. The total amount of food consumed per week, in terms of the number of portions was also calculated by adding the number of portions for each food item. Therefore, it was possible to calculate the contribution of each food group to total food consumption and compare these proportions with the Balance of Good Health; the steps are outlined in Table 5.31 using a random case.

1. Calculate total number of portions per week for each food group - e.g. the sum of the values for each food item as shown in Table 5.30.
2. Add the values for each food group to obtain the overall total food consumption.
3. Divide each food group value by the total value and multiply by 100 to obtain a percentage value for each food group - this is the proportion that each food group contributes to the total food intake, for each household.
4. Compare this percentage with the recommended percentage from The Balance of Good Health. A value of 1 indicates consumption of the proportions recommended by the Balance of Good Health, whilst below or above a value of 1 represents deviation from this recommended amount.

	Bread, Cereals and Potatoes	Fruit and Vegetables	Dairy Products	Meat, Fish and Alternatives	Sugary and Fatty Foods
Recommended Proportions	*33%*	*33%*	*15%*	*12%*	*8%*
1. Calculate totals for each food group for one household	64	19	9	8	50.5
2. Calculate total food consumption	Total Food Intake = 150.5 portions per week				
3. Food group consumption as a % of total	42.5%	12.6%	6%	5.3%	33.5%
4. Compare with recommended proportions	42.5/33 = 1.3	12.6/33 = 0.38	6/15 = 0.4	5.3/12 = 0.4	33.5/8 = 4.2

Table 5.31 Illustrative example of the healthy eating score calculation, based on The Balance of Good Health, using the data from one household in the study population.

Note: The same sample household is used in the calculations in Tables 5.31 and 5.32.

5.4.4.2 Difficulties with using The Balance of Good Health

The main difficulty with considering the food data in this way is that the frequency of intake (number of portions) obtained from the questionnaire gives no indication of the physical quantities of food consumed. For example, the average values for the sweet and fatty food group are much higher than one due to a high frequency of foods consumed within this group. The problem however, is that although the number of portions of these types of food may be high, the amounts eaten (portion size) may be small. So in terms of the proportions featured on the Balance of Good Health, the intake for sweet and fatty foods may actually be closer to the recommended proportions than the figures would actually suggest. Due to this discrepancy between the recommended proportions and the number of portions, another method has been considered.

5.4.4.3 Developing a Measure of Healthy Eating using COMA Recommendations

The COMA recommendations detailed in section 5.4.2 can be used instead of the Balance of Good Health to develop a healthy eating index. The advantages of this method are that these recommendations represent food intake as a number of portions rather than as a proportion of total food intake. This means that the portion size can be assumed to be constant, even though in practice there will be considerable variation in the physical quantities of food consumed. The steps are detailed in Table 5.32.

1. From the food consumption data we can calculate the total number of portions for each food group consumed per person per week.
2. As we know the actual intake for each household and the recommended intake from COMA, we can calculate the proportion of ideal portions consumed.
3. This can be converted into a percentage, which shows the percentage of ideal portions consumed by the household for each food group.

	Bread, Cereals and Potatoes	Fruit and Vegetables	Dairy Products	Meat, Fish and Alternatives	Sugary and Fatty Foods
Recommended COMA portions per food group	*53.5*	*42*	*16.5*	*11.5*	*52*
1. Calculate totals for each food group	64	19	9	8	50.5
2. Compare with recommended portions	64/61.5 = 1.04	19/42 = 0.45	9/16.5 = 0.55	8/11.5 = 0.70	50.5/52 = 0.97
3. Percentage of recommended portions	104%	45%	55%	70%	97%

Table 5.32 Illustrative example of the healthy eating score calculation, based on COMA recommendations, using the data from one household in the study population.

5.4.4.4 Which method for calculating the healthy eating scores?

Descriptive analysis of the food intake data highlights some problems with the way in which the food group values were calculated. The values for Sugary and Fatty foods are much higher than the values for the other four groups. As the number of food items contributing to the final score within each group is different (e.g. 8 for dairy products and 19 for sugary and fatty foods, see Table 2.0) it is suspected that this is unfairly influencing the results. The values for sugary and fatty foods are artificially high because there are more food items included in this category. This does not mean that the actual proportion of these foods is necessarily high, only that an individual has more opportunities to add to their score because of the greater number of small portions of these foods consumed. Because of this, the Balance of Good Health method is unsuitable unless the number of food items in each group can be standardised. Using the number of portions compared with COMA (1994) is therefore more appropriate.

5.4.4.5 Healthy Eating Score Results

Using the percentage of ideal portions consumed by the household for each food group (shown in Table 5.32, step 3) a healthy eating score can be derived using pragmatic acceptable limits which have been defined for each food group. The steps are outlined in Table 5.33. The limits that have been defined for each food group are detailed in Appendix I.

	Bread, Cereals and Potatoes	Fruit and Vegetables	Dairy Products	Meat, Fish and Alternatives	Sugary and Fatty Foods
1. Percentage of recommended portions	104%	45%	55%	70%	97%
2. Identify range in which value shown in step 1 falls and calculate healthy eating score.	If value 100%-150% then HES=1	If values <100% then HES = 1-((100-%)/100)	If values <90% then HES = 1-((90-%)/100)	If values <90% then HES = 1-((90-%)/100)	If values 0%-100% then HES = 1
3. Healthy Eating Scores (HES) for each food group Household	1	0.45	0.65	0.8	1

Table 5.33 Calculation of household healthy eating score using percentage of recommended COMA portions and pragmatic acceptable limits for each food group

The healthy eating scores have been calculated for each household within the study population using the COMA (1994) portion recommendations, and the distribution of the results can been seen in Figure 5.6.

The maximum value is five, which indicates that household intake of each of the food groups, falls within the pragmatic acceptable limits, defined in Appendix I, and is thus defined as "healthy".

Lower values represent less healthy intakes, the lower the score the further the food group intake deviate from the COMA recommendations and the pragmatic limits that have been defined around these.

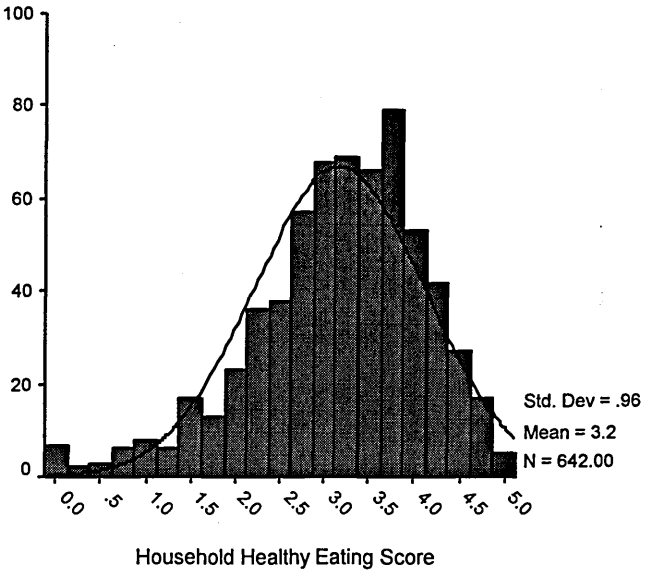


Figure 5.6 Distribution of Healthy Eating Scores within the Sample

5.4.5 Food Consumption - Principal Components Analysis

Principal components analysis was applied to the food consumption data to determine whether combinations of food items could be identified that would explain a proportion of the variance in the data set and thus provide a more meaningful insight into the patterns of foods consumed. Initially the whole data set was analysed using principal components analysis and 7 seven components were identified which accounted for 32% of the variance. Varimax rotation was then applied to aid in the interpretation of the factors. The rotated component matrix is can be seen in Table 5.34, with the coefficients shown for the food items most strongly correlated with each component.

Examination of the table shows that component 1 is most strongly correlated with whole foods, fresh fruit and vegetables, component 2 with sugary and fatty snacks, component 3 with rice, pasta and sauces, component 4 with convenience foods, component 5 with meat products, component 6 with milk, butter and bread, and finally component 6 with processed fruit and puddings.

The seven factor scores for each household are calculated using a regression equation, where each food item score is multiplied with the factor coefficient. Thus, each household will have a single score for each factor that is associated with the consumption of the food items shown in Table 5.34. The values generated during the analysis using SPSS were saved as variables.

Rotated Component Matrix for all food items

	1	2	3	4	5	6	7
Fresh vegetables	0.683						
Fresh fruit	0.643						
Salad	0.577						
Pulses	0.428						
Fresh potatoes	0.463						
Wholemeal and brown bread	0.415						
High fibre cereals	0.301						
Biscuits		0.795					
Crisps		0.733					
Sweets		0.565					
Cake		0.564					
Rice			0.733				
Pasta			0.676				
Creamy sauces			0.497				
Tomato sauces			0.313				
Jars of ready made sauces			0.493				
Potato products				0.686			
Beans				0.539			
Chips				0.495			
Tinned vegetables				0.455			
Frozen vegetables				0.387			
Vegetable pies				0.308			
Meat burgers					0.667		
Meat pies					0.589		
Pate					0.519		
Butter						0.745	
Milk						0.741	
White Bread						0.512	
Stewed fruit							0.592
Tinned fruit							0.588
Puddings							0.524
Cream							0.300

Table 5.34 Principal Components for Food Data

Sampling Adequacy and Component Selection Criteria

- Bartlett's Test of Sphericity is used to determine whether the correlation matrix is an identity matrix. If the significance level is large, the use of factor analysis should be reconsidered. In this case Bartlett's Test of Sphericity = 7279.304, sig. = 0.000 thus the correlation matrix is not an identity matrix and principal components analysis is valid.

- Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. A KMO value of less than 0.5 is unacceptable and factor analysis is not advised. In this case the KMO value = 0.754 and factor analysis is valid.
- The components were selected using eigenvalues greater than 1.0 and the scree plot. Using the eigenvalues 20 components were selected. The scree plot was then examined to identify the cut off point to determine the number of components that could be used to describe the greatest variation within the sample - seven components were identified (shown in Table 5.34).

Instead of analysing the food data in terms of consumption within each of the five food groups, as defined by the Balance of Good Health, these components can be used as a measure of the variance. Each household's component score has been taken as an indicator of the consumption of the food items associated with it. These values will be used in chapter six.

5.4.6 Summary

- The study population as a whole fail to meet the dietary recommendations set out by COMA (1994) in terms of consumption of food items and food groups.
- There were a few exceptions; fruit and vegetable intake if compared to the "Five a Day" target met the recommendations, but not if calculated on the portions given by COMA (1994); fish and oily fish met the recommendations; also sweet and fatty foods.
- The recommendations (COMA, 1994) were used to develop a measure of healthy eating, which had a maximum score of five. Maximum scores were achieved if the COMA recommendations were met and the balance of the diet was close to that shown in The Balance of Good Health. The mean healthy eating score for the study population was 3.15 but the distribution was positively skewed.
- Principal component analysis identified seven components that have been used to describe variation in food consumption within the study population. The components grouped food items into identifiable *food groups* or *meal types;* each household has a food component score that is associated with consumption of the identified food items.

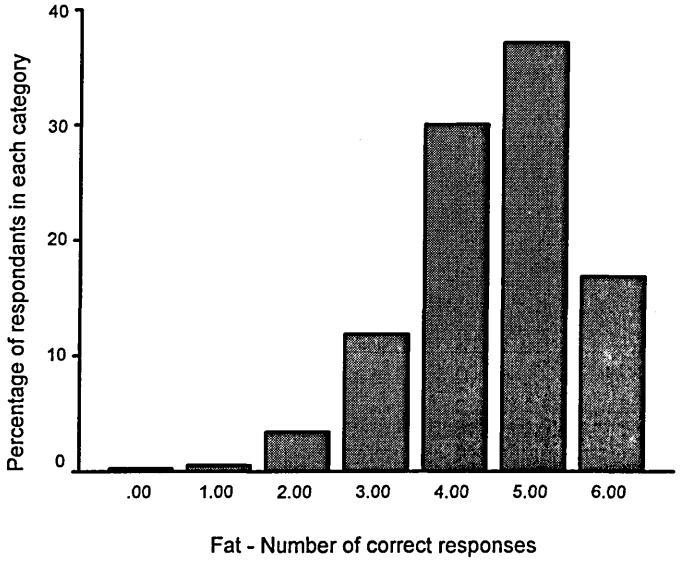
5.5 Nutrition Knowledge, Attitudes to Food and Nutrition and Cooking Skills

The main food provider was asked a series of questions in Part D of the questionnaire to determine their level of nutrition knowledge, attitude towards food and nutrition, and confidence in their cooking skills. In addition they were asked to state whether they had had any formal nutrition education, where they had gained their cooking skills and the main sources of information used to provide them with food and nutrition knowledge.

5.5.1 Nutrition Knowledge

The nutrition knowledge questions were designed to examine knowledge of five main areas related to healthy eating: fat, energy, fibre and sodium intake, and fruit and vegetable consumption. The percentages of correct responses for each statement are given below, in addition to the cumulative scores for each area of knowledge.

5.5.1.1 Fat intake



Fat reduction is the most widely publicised healthy eating message, so it was anticipated that the percentage of correct responses in this section would be quite high.

The highest number of correct responses was seen for statements (1,2,5,6,) which related to cooking methods or food choices associated with reducing fat intake.

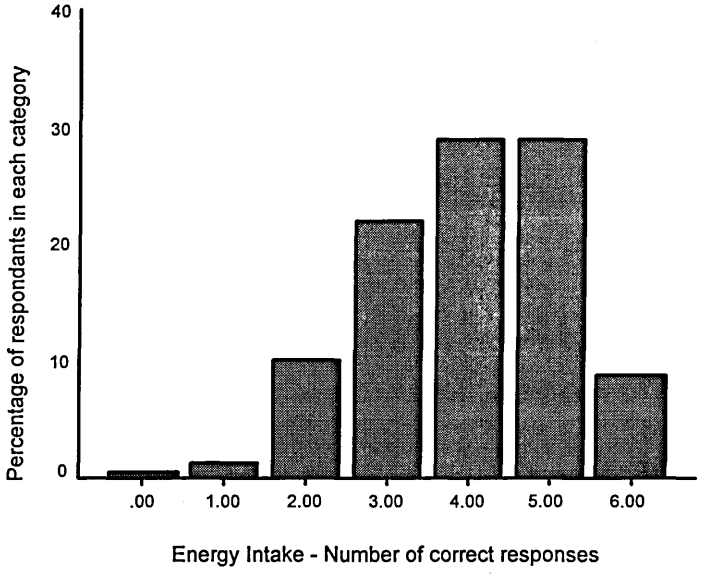
The statements (3,4) which yielded a lower percentage of correct responses were related to the actual fat content of foods.

The table below shows the percentage of correct responses for each statement but the graph shows the cumulative response rates. 84% of the sample answered four or more of the statements correctly.

	Statement N = 642	% Correct Responses
1.	Grilling rather than roasting or frying foods will lower their fat content - (True)	96%
2.	Eating less full fat dairy products will help to reduce your intake of saturated fat - (True)	89.9%
3.	Low fat spread contains less than one quarter the fat of butter - (False)	53.7%
4.	Salad cream contains the same amount of fat as mayonnaise - (False)	38.9%
5.	All nuts contain more fat than raisins - (True)	83.8%
6.	Edam cheese contains less fat than traditional Cheddar - (True)	72.9%

Table 5.35 Fat Knowledge

5.5.1.2 Energy Intake



Energy balance is an important issue with levels of obesity continuing to rise. On average, we have decreased our energy intake but there has also been a steady decline in the levels of energy expenditure from physical activity, leading to a net positive energy imbalance. Therefore, it is important to look at the levels of nutrition knowledge relating to energy intake.

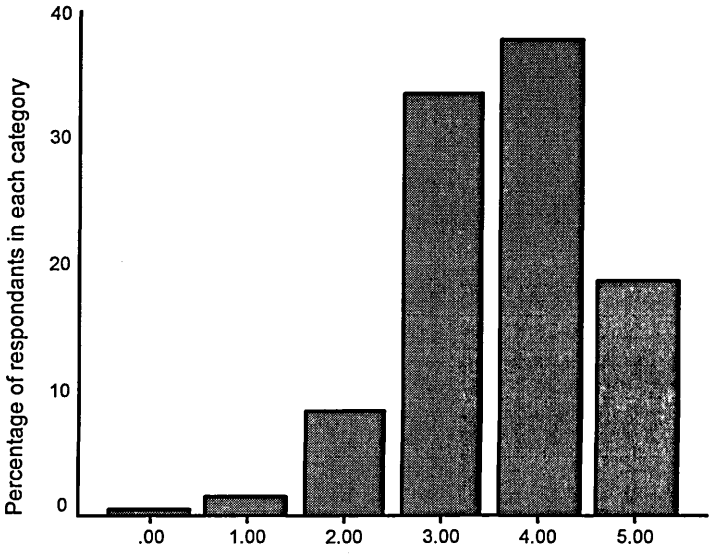
The percentage of correct responses was lower for this set of statements compared to those for knowledge about fat intake and the fat content of foods. Statement 4 had the highest number of correct responses (89%), with statement 2 having 10% correct responses.

Of the remaining statements (1,3,5,6) only about half of the respondents answered them correctly. Table 5.36 shows the percentage of correct responses for each statement but the graph shows the cumulative response rates.

	Statement N = 642	% Correct Responses
1.	Protein foods (e.g. meat, fish or dairy products) should form the main part of any meal - (False)	52.5%
2.	Pasta meals should not be eaten if you are trying to lose weight - (False)	10.6%
3.	Fat has more than twice the calories (energy) weight for weight than sugar - (True)	56.1%
4.	About 50% of total energy intake should come from carbohydrates - (True)	89.4%
5.	The best way to reduce total energy in the diet is to reduce sugar in the diet - (False)	35.8%
6.	A high energy intake has been associated with obesity - (False)	47.4%

Table 5.36 Energy Intake Knowledge

5.5.1.3 Fruit and Vegetables



Fruit & Vegetables - Number of correct Responses

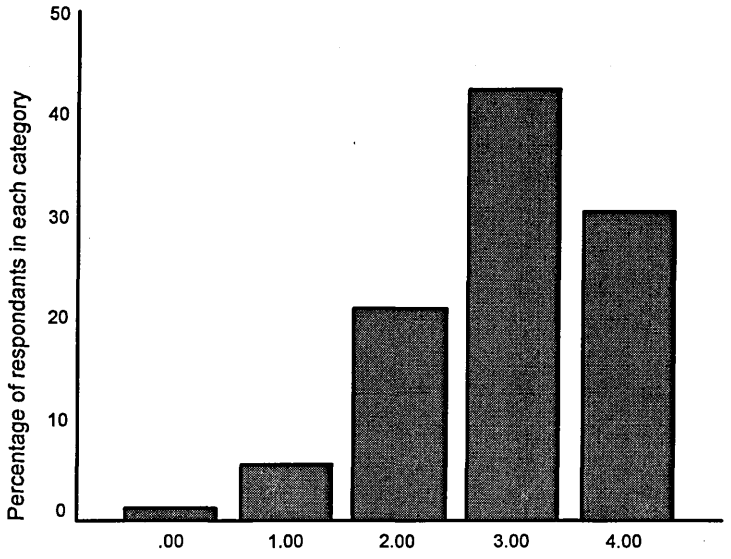
The correct responses are also quite high for the knowledge of fruit and vegetable consumption. Statements 1,3 and 4 indicate good knowledge of the nutrients contained in fruit and vegetables and ways to prepare them to maintain their nutrient value. Statement 2 probably has a lower correct response rate because it could be misleading when the recommended intake is actually 5 portions per day. However, the low number of correct response for statement 5 is quite surprising and indicates that many people believe that tinned fruit is as good a source of vitamin C as fresh fruit

	Statement N = 642	% Correct Responses
1.	To keep Vitamin C in fresh vegetables they should be cooked for a short time - (True)	94.2%
2.	It is recommended that people eat up to 3 portions of fruit and vegetables every day - (False)	56.7%
3.	Frozen vegetables are as good a source of Vitamin C as fresh vegetables - (True)	65.4%
4.	Fruit and vegetables are good sources of antioxidant vitamins - (True)	87.4%
5.	Tinned fruit contains the same amount of Vitamin C as fresh fruit - (False)	27.7%

Table 5.37 Fruit and Vegetable Knowledge

Table 5.37 shows the percentage of correct responses for each statement but the graph shows the cumulative response rates.

5.5.1.4 Fibre intake



Fibre - Number of correct responses

The fibre statements were designed to test knowledge about the fibre content of foods and their effect on health. The term "fibre" was used as opposed to the technical term "non-starch polysaccharides" as it was thought to be a term more easily recognised by the population.

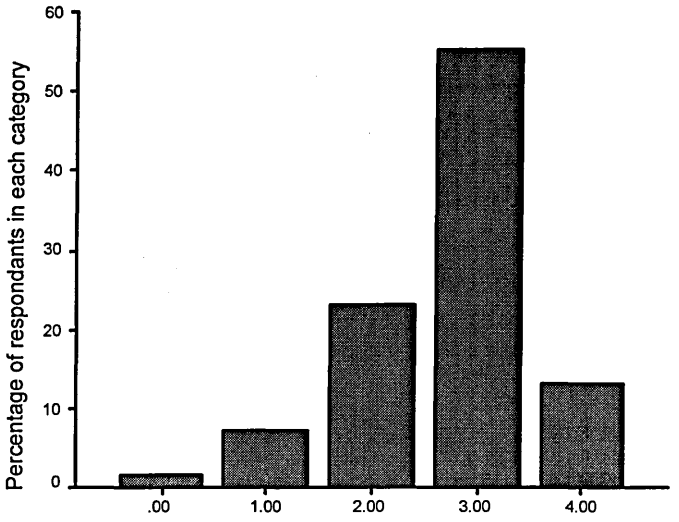
	Statement N = 642	% Correct Responses
1.	Complex carbohydrates contain more starch and fibre than simple carbohydrates - (True)	53.4%
2.	Orange juice contains more fibre than an apple - (False)	31.9%
3.	A high fibre diet will help to develop strong teeth - (False)	16.5%
4.	A high fibre diet will help to prevent bowel cancer - (True)	90.2%

Table 5.38 Fibre Knowledge

Apart from statement 4 the correct response rate is low indicating poor knowledge of the fibre content of foods. Although the majority seem to be aware of the need to consume fibre to maintain gut health the low awareness of the fibre content of foods may lead to poor choices being made.

5.5.1.5 Sodium (Salt) Intake

The high correct response rate for statements 1-3 indicate a good knowledge of the affects of sodium on health and the main sources of sodium in the diet. However, as statement 4 shows, many people believe that average sodium intakes meet the recommendations when in reality they far exceed the given values.



Salt - Number of correct responses

This may suggest that although people are aware of the risks involved with high intake of sodium and are aware of food products with a high sodium content they may already feel as though they are meeting the recommendations and therefore not attempt to reduce their intake of sodium.

Statement N = 642	% Correct Responses
A standard packet of potato crisps contains more sodium than a bowl of Cornflakes - (False)	75.7%
A low sodium diet (e.g. low in salt) will help to reduce high blood pressure - (True)	93.8%
The main source of sodium in the diet is processed food - (True)	74.9%
On average sodium intakes meet the dietary recommendations - (False)	22.1%

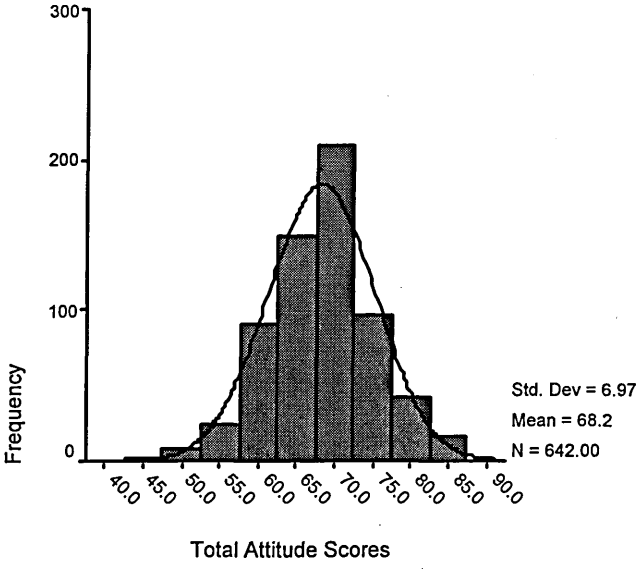
Table 5.39 Sodium (salt) Knowledge

5.5.2 Attitudes to Food and Nutrition

The attitude statements in Part D of the questionnaire were designed to measure the main food provider's attitude towards choosing and preparing healthy foods. Table 5.40 shows the mean score for each of the statements and the standard deviation. The higher scores (out of a maximum of 5.0) reflect attitudes that are more health orientated. The scoring system for each of the statements can be found in Appendix J. Missing data was assigned a median value of 3.0.

	Mean Score	Std. Dev
Butter is natural therefore I prefer to buy it rather than margarine.	3.75	1.04
It doesn't matter what type of fat you eat, all fats are harmful.	3.77	0.98
Low fat foods are less acceptable to me because they don't taste as good.	3.80	1.02
Eating between meals is bad for you.	2.81	1.14
The amount of energy in food is more important to me that the nutrients.	3.95	0.73
It doesn't matter what you eat as long as you vary your diet a lot.	3.31	1.12
Increasing fruit and vegetables in my diet is time consuming.	3.94	0.90
Increasing fruit and vegetables means choosing foods, which I find boring.	4.02	0.87
I would not choose fresh fruit as a snack as it is not filling enough.	3.83	0.95
I prefer to buy white bread rather than wholemeal.	3.28	1.17
Meals based on rice and pasta are not suitable for main family meals.	4.29	0.78
Cutting out salt added at the table will lower my sodium intake.	4.05	0.83
Reducing processed foods will not significantly reduce my sodium intake.	3.59	1.01
Reduced sodium products are lacking in flavour.	3.46	0.90
Home made cakes and pastries are better for my family than shop bought.	4.06	0.78

Table 5.40 Food and Nutrition Attitude Statements



The individual scores for each attitude statement can be added together to obtain a total score for attitudes to food and nutrition.

The maximum score attainable for this section of the questionnaire was 90 so the majority of scores fall in the upper two thirds. Missing values have been replaced by the median.

5.5.3 Confidence in Cooking Skills

The main food provider was given three statements that they could respond to on a scale of 1-5, indicating their level of agreement. The mean scores for each statement and standard deviation is given in Table 5.41.

Confidence Statement	Mean Score	Std. Dev
My cooking skills are adequate for preparing food for my family.	4.07	0.78
I feel as though I have enough time to provide for my family.	4.07	0.78
I feel as though the foods I provide for my family are healthy and nutritious.	4.07	0.78

Table 5.41 Confidence in Cooking Skills

The scores for each individual statement were combined to give each main food provider a score to represent the level of confidence in their cooking skills. The population mean was 12.2 with a standard deviation of 2.34.

5.5.4 Information Sources and Cooking Skills

The main food provider was asked to identify their main sources of information regarding food and nutrition and where they gained their cooking skills

N=642	Main Sources of Information		Cooking Skills	
	Frequency	Valid %	Frequency	Valid %
Formal Education	290	**45.2%**	244	**38%**
Mother	284	**44.2%**	465	**72.4%**
Other family member	49	7.6%	87	13.6%
Partner	62	9.7%	78	12.1%
Friends	106	16.5%	97	15.1%
Health Professional	116	18.1%	17	2.6%
Media (TV, magazines, papers)	426	**66.4%**	205	**31.9%**
Supermarkets	205	31.9%	36	5.6%

Table 5.42 Main Sources of Cooking Skills and Food and Nutrition Knowledge

5.5.5 Summary

- In general higher nutrition knowledge scores where obtained for questions relating to current healthy eating messages and food choice, whilst lower scores were obtained for those asking about the nutrient content of foods.
- Attitudes were on average relatively health orientated, which is what one would expect, as those who were more interested would be more likely to complete and return the questionnaire.
- The main food provider was confident in their cooking skills, their ability to provide nutritious food for the family in the time available to cook.
- Formal education, mother and the media were the most common sources of information and cooking skills used by the main food provider.

The results for the nutrition knowledge statements require further explanation. The overall scores for nutrition knowledge were generally high but some of the statements had anomalous results. Some statements had a very low percentage of correct responses; for example, the statement relating to the amount of vitamin C in fresh fruit which only had a correct response rate of 27%. Whilst issues of reliability and validity must be considered (see section 7.2) the results also suggest that some elements of the respondents' nutrition knowledge is flawed.

Chapter 6 - Further Analysis

6.1 Further Analysis and Results

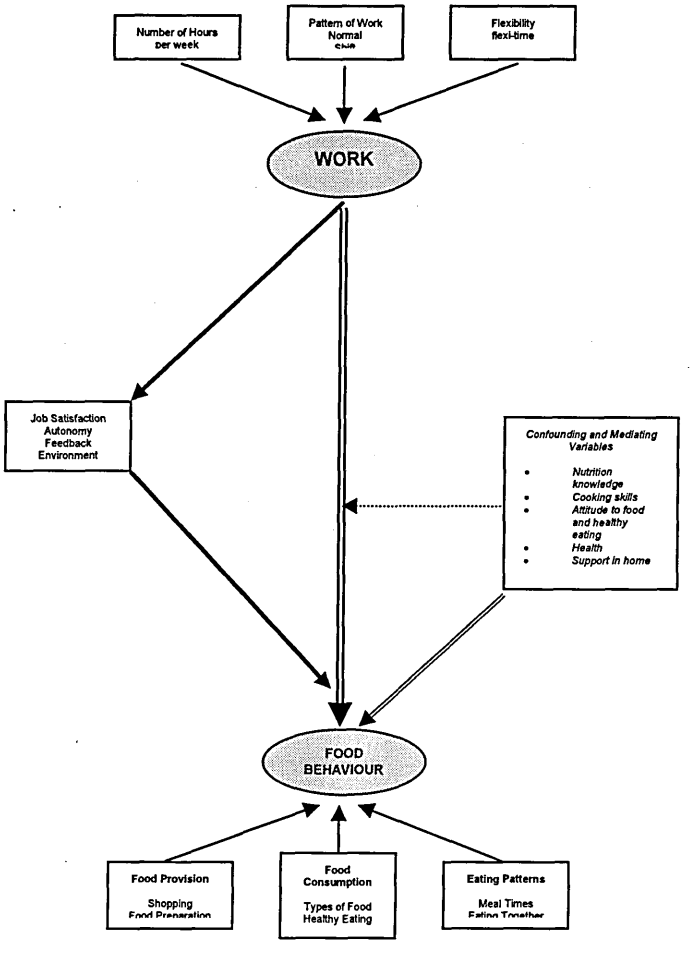


Figure 6.1 Research Model

In the previous chapter details of the descriptive analysis of the questionnaire data were presented. The study population has been described in terms of their work, job satisfaction and food behaviour; how much time they spend at work, how they feel about work, their involvement in food provision and the types of food they eat. Background information has also been compiled to provide a profile of the population in terms of household composition, income, occupation and education. In addition the nutrition knowledge, cooking skills and attitudes towards food and nutrition of the main food provider have been considered.

The next stage, which is the focus of this chapter, was to use these variables to determine whether an association exists between the work and food behaviour. The hypotheses, outlined in chapter three, have been used as the basis for this further analysis. Figure 6.1 shows the four main relationships to be tested (1-4) and within each line of enquiry several variables will be used to test for association. For example, to test relationship 1, between work and food behaviour, the work variables (hours, pattern of work and flexibility) will be considered against the food behaviour variables (food provision, consumption and patterns of eating).

Details of the main statistical tests used for the analysis in this chapter are given in section 4.4 (page 61). At the end of each section a brief summary will be given outlining the main results and linking these with the original hypotheses. These results are briefly discussed at the end of each section but the main discussion, with reference to the literature and research hypotheses, can be found in chapter seven.

6.2 Work and Food Behaviour

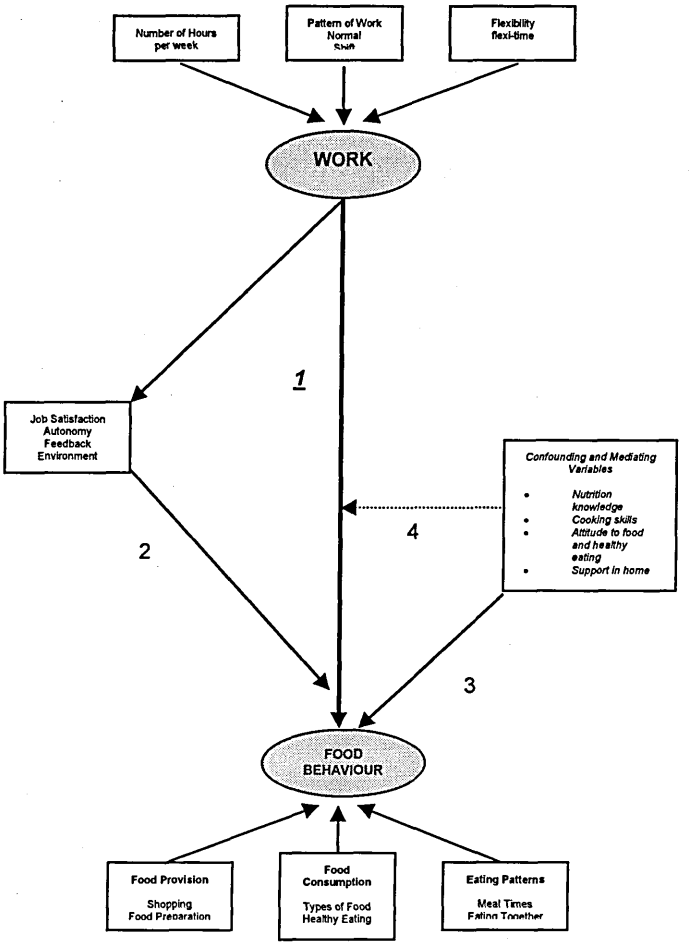


Figure 6.2 Model of the Hypothesised Relationships between Work and Food Behaviour

In this section, the hypothesised relationship between work and food behaviour is explored. The main objective for this research was to determine whether a relationship exists between the work and food behaviour. Therefore, the variables used to describe these concepts alone will be used for the analysis in this section, without taking into account the possible influence of intervening variables. Details on the statistical tests used in this section can be found in Chapter 4. Throughout this section, the variables used to describe the dimensions of work will be considered as the independent variables. The main hypotheses to be tested are as follows:

***Hypotheses 1* - Time Committed to Work and Food Behaviour**

The total number of hours committed to work each week[a] will influence the food behaviour of the household such that:

- as working hours increase less time is spent food shopping and food preparation
- as working hours increase the responsibility for food shopping and food preparation changes to accommodate work commitments
- as working hours increase the consumption of convenience products increases
- as working hours increase food consumption changes to accommodate work commitments and the balance of food groups within the diet becomes less health orientated
- as working hours increase patterns of food consumption change

- as working hours increase fewer meals are eaten together as a family

*Working hours will be considered for the main food provider, the other adult, and for the main food provider and other adult combined which will be used to represent the total number of hours committed to work per household.

Hypotheses 2 - **Flexibility, Working Pattern and Food Behaviour**

The flexibility over the hours worked and pattern of work of the main food provider and other adult will influence the food behaviour of the household so that:

- the ability to work flexi-time will increase the time spent in food shopping and food preparation
- shift work will decrease the time spent in food shopping and food preparation
- the ability to work flexi-time changes the responsibility for food shopping and food preparation to accommodate work commitments
- shift work changes the responsibility for food shopping and food preparation to accommodate work commitments
- the ability to work flexi-time decreases the consumption of convenience products
- shift work increases the consumption of convenience products
- the ability to work flexi-time leads to changes in food consumption to accommodate work commitments and the balance of food groups within the diet becomes more health orientated
- shift work leads to changes in food consumption to accommodate work commitments and the balance of food groups within the diet becomes less health orientated
- the ability to work flexi-time means that more meals are eaten together as a family
- shift work means that fewer meals are eaten together as a family

6.2.1 Working Hours and Food Provision Activities

To determine whether there were any differences in the mean number of hours worked and food provision activities, the working hours of the main food provider, Adult 2 and total household hours are considered with time and division of labour for food shopping and preparation. One way analysis of variance was used to compare the mean number of hours worked between the food provision groups for time and division of labour; for example, the mean number of hours worked per week by the main food provider was compared in households who spent "less than 1hr", "1-2hrs", "2-3hrs" or "more than 3hrs" food shopping.

6.2.1.1 Time Spent in Food Shopping and Food Preparation: ANOVA

The average amount of time spent in all food shopping trips and in food preparation, during the week and at the weekend, is detailed in sections 5.3.1.4 and 5.3.2.2. Tables 6.1, 6.2 and 6.3

show the mean working hours, for the MFP, A2 and household, within each of the food shopping and food preparation categories. One way analysis of variance (ANOVA) was used to determine whether the mean working hours differed significantly between the food shopping and preparation groups. The F statistic revealed no significant differences between any of the food provision groups. Therefore, the amount of time spent in food shopping and food preparation, during the week and at the weekend, is not associated with the number of hours committed to work by the MFP, A2 or total household hours.

Time spent Food Shopping per Week		Less than an hour	1-2 hours	2-3 hours	More than 3 hours	F	Sig.
Mean number of hours worked per week	Adult 1	27.6	26.0	25.4	27.4	0.615	0.606
	Adult 2	44.1	42.6	43.1	44.1	0.383	0.766
	Household	55.7	58.2	60.2	58.6	0.535	0.658

Table 6.1 One-Way ANOVA Time spent food shopping and average working hours per week

Time spent in Food Preparation during the Week		Less than 30mins	30-60mins	More than 60mins	F	Sig.
Mean number of hours worked per week	Adult 1	25.7	26.2	28.2	0.601	0.549
	Adult 2	44.3	42.0	44.9	2.742	0.065
	Household	59.5	58.9	56.5	0.365	0.694

Table 6.2 One-Way ANOVA Time spent in food preparation during the week and average working hrs per week

Time spent in Food Preparation at the Weekend		Less than 60mins	60-90mins	More than 90mins	F	Sig.
Mean number of hours worked per week	Adult 1	25.5	26.2	28.1	1.925	0.147
	Adult 2	43.2	42.6	43.5	0.161	0.851
	Household	58.1	61.2	59.6	0.922	0.398

Table 6.3 One Way ANOVA Time spent in food preparation at the weekend and average working hrs per week

6.2.1.2 Responsibility for Food Shopping and Food Preparation: ANOVA

One way analysis of variance was also used to determine whether the responsibility for food provision activities was associated with working hours. For example, to determine whether more hours worked by the main food provider led to a more equal division of responsibility in terms of food shopping and food preparation. Tables 6.4 to 6.7 show the mean number of hours worked within each of the food provision groups related to responsibility. The F statistic was used to identify whether there were any significant differences between the groups and the post hoc Tukey's HSD and LSD tests highlight where the differences lie.

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the main food shopping?		MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean hours worked per week	MFP	25.6	24.4	28.4	3.90	.021			•		•	•
	Adult 2	44.8	44.2	40.7	5.45	.005		•	•		•	•
	Household	54.5	63.2	62.0	10.53	.000	•	•		•	•	

Table 6.4 One-Way ANOVA Division of responsibility for main food shopping and average working hrs/ week

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the top up food shopping?		MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean hours worked per week	MFP	24.5	23.8	28.2	6.53	.002		•	•		•	•
	Adult 2	46.3	44.0	40.4	10.85	.000		•	•		•	•
	Household	54.3	61.5	63.0	9.07	.000	•	•		•	•	

Table 6.5 One-Way ANOVA Division of responsibility for top up food shopping and average working hrs/week

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the food prep during the week?		MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean hours worked per week	MFP	24.7	23.8	29.9	10.70	.000		•	•		•	•
	Adult 2	44.9	43.9	40.6	5.71	.004		•	•		•	•
	Household	53.6	62.5	66.0	17.86	.000	•	•		•	•	

Table 6.6 One-Way ANOVA Division of responsibility for food prep during the week & average working hrs

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the food prep at the weekend?		MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean hours worked per week	MFP	25.8	23.7	27.3	3.51	.031			•			•
	Adult 2	45.4	45.0	41.4	6.61	.001		•	•		•	•
	Household	53.8	62.7	62.8	9.79	.000	•	•		•	•	

Table 6.7 One-Way ANOVA Division of responsibility for food prep at the weekend and average working hrs

The above tables show that there are significant differences between the number of hours worked in all of the food provision categories. The post hoc tests (Tukey's HSD and LSD)

reveal where the differences lie, e.g. between which food provision groups there are significant differences in the number of hours worked. These results are as follows;

- The number of hours worked by the main food provider is significantly higher in households that share the responsibility for all food shopping and food preparation equally. In households where the main food provider takes sole responsibility for food provision or is only sometimes helped by Adult two, their mean working hours are less.
- The number of hours worked by Adult 2 is significantly higher in households where the main food provider takes all or most of the responsibility for food provision. In households where responsibility is shared equally, Adult 2 works fewer hours.
- The total number of household hours worked per week is significantly lower in households where the main food provider takes sole responsibility for food provision.

In summary, these results suggest that there is a more equal distribution of responsibility for both food shopping and food preparation if the main food provider works more hours or if Adult two works fewer hours per week.

6.2.2 Correlation of Working Hours with Food Group and Convenience Food Intakes and Healthy Eating Scores

The intakes of starchy foods, fruit and vegetables, meat and fish, dairy products, sweet and fatty foods, and convenience foods for each household were correlated with working hours. In addition, the household healthy eating score was correlated with working hours to determine whether changes in the balance of the diet were associated with time committed to work. The correlation coefficients for the aforementioned variables are shown in Table 6.8.

There is a positive significant correlation ($p=0.04$) between the total household number of hours worked and the consumption of starchy foods. This would suggest that as the total number of hours committed to work each week increase the consumption of starchy foods also increase. However, the correlation coefficient for this association is small ($r=0.083$); thus the likelihood that this has occurred by anything other than chance is very small. In addition as there are no significant results for the working hours of either adult with any of the food consumption variables it is dubious that significant results are only present when the working hours are combined.

Therefore, it can be concluded that within the study population;

- working hours are not associated with food group and convenience food consumption
- working hours are not associated with the balance of food groups consumed; as measured by the household Healthy Eating Score (HES).

		Working Hours		
		Main Food Provider	Adult 2	Total for Household
Starchy Foods	Pearson Correlation	-0.020	0.029	***0.083****
	Sig. (2-tailed)	0.645	0.508	***0.040***
	N	532	513	***611***
Fruit and Vegetables	Pearson Correlation	-0.029	0.026	0.023
	Sig. (2-tailed)	0.508	0.563	0.565
	N	532	513	611
Meat, Fish and Alternatives	Pearson Correlation	0.025	-0.026	0.059
	Sig. (2-tailed)	0.563	0.564	0.143
	N	532	513	611
Dairy Products	Pearson Correlation	-0.049	-0.012	0..043
	Sig. (2-tailed)	0.256	0.785	0.285
	N	532	513	611
Sweet and Fatty Foods	Pearson Correlation	-0.050	-0.062	0.007
	Sig. (2-tailed)	0.247	0.160	0.858
	N	532	513	611
Convenience Foods	Pearson Correlation	0.049	0.016	0.055
	Sig. (2-tailed)	0.255	0.721	0.176
	N	532	513	611
Healthy Eating Scores	Pearson Correlation	-0.036	-0.049	0.047
	Sig. (2-tailed)	0.407	0.271	0.243
	N	532	513	611

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 6.8 Correlation of Working Hours , Food Group Intakes and Healthy Eating Scores

6.2.3 Correlation of Working Hours with Food Component Scores

To determine whether the variation in food consumption within the study population was associated with the working hours a correlation matrix was obtained of working hours with the household food component scores, shown in Table 6.9.

The analysis identified a positive significant correlation (p=0.018) between total household hours and consumption of rice pasta and ready-made sauces. This suggests that as the number of hours worked within the household increases so too does the consumption of rice, pasta and ready made sauces. However, the correlation coefficient for this association is very low (r=0.096) and there is no association with the working hours of either adult, so it is unlikely to have occurred due to anything more than chance.

		Working Hours		
		Main Food Provider	Adult 2	Total for Household
Fresh Food, Fruit and Veg	Pearson Correlation	-0.023	0.006	0.010
	Sig. (2-tailed)	0.601	0.891	0.800
	N	532	513	611
Sweet Fatty Snacks	Pearson Correlation	-0.019	-0.049	0.024
	Sig. (2-tailed)	0.664	0.271	0.588
	N	532	513	611
Rice and Pasta Ready Sauce	Pearson Correlation	0.032	0.058	***0.096****
	Sig. (2-tailed)	0.455	0.189	***0.018***
	N	532	513	***611***
Convenience Chips, beans, frozen veg	Pearson Correlation	-0.020	-0.029	-0.052
	Sig. (2-tailed)	0.652	0.516	0.202
	N	532	513	611
Meat pies and burgers	Pearson Correlation	0.048	-0.017	0.016
	Sig. (2-tailed)	0.273	0.705	0.685
	N	532	513	611
Milk and Bread	Pearson Correlation	***-0.088****	-0.013	-0.022
	Sig. (2-tailed)	***0.041***	0.773	0.585
	N	***532***	513	611
Puddings and Cream	Pearson Correlation	***-0.092****	0.055	-0.049
	Sig. (2-tailed)	***0.034***	0.212	0.224
	N	***532***	513	611

*** Correlation is significant at the 0.01 level (2-tailed)*

** Correlation is significant at the 0.05 level (2-tailed)*

Table 6.9 Correlation of Working Hours and Food Component Scores

There are also negative significant associations highlighted between the hours worked by the main food provider and consumption of milk and white bread and puddings and cream (p=0.041, p=0.034). This would suggest that as the main food provider's working hours increase the consumption of these types of food decrease. However, the correlation coefficients are again very small (-0.088 and -0.092 respectively). In summary there does not appear to be any strong association between the number of hours worked and the variation in food consumption within the study population.

6.2.4 Working Hours and Eating Patterns: ANOVA

The eating patterns of the study population, during the week and at the weekend, have been discussed in section 5.3.3.1. One way analysis of variance was used to compare the mean number of hours worked between the eating pattern groups; for example, to compare the mean

number of hours worked per week by the main food provider in households who "always", "sometimes" or "never" ate their main meal together as a family.

Tables 6.10 and 6.11 show the results for the AVOVA of the working hours and different eating pattern groups during the week and at the weekend respectively. The F statistic is shown to highlight significant differences in working hours and Tukey's HSD and LSD post hoc test results are also shown to highlight where significant differences have been identified between the groups.

6.2.4.1 Eating Patterns during the Week

During the Week	Mean number of hours worked per week					Post Hoc Tests					
						Tukey's HSD			LSD		
Eating Together	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	25.9	25.2	26.3	0.295	0.744						
Adult 2	41.4	43.7	46.3	4.178	0.016		•		•	•	
Total for Household	56.8	62.8	64.9	6.121	0.002				•	•	
1 Adult & Children	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	26.3	24.8	25.9	0.721	0.487						
Adult 2	43.2	44.2	41.8	0.911	0.403						
Total for Household	55.3	62.1	57.7	4.774	0.009	•			•		
Children Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	26.3	25.5	25.1	0.113	0.893						
Adult 2	47.8	43.4	43.8	1.460	0.234						
Total for Household	61.1	61.3	61.8	0.028	0.973						
Adults Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	26.6	26.2	22.0	4.263	0.015			•		•	•
Adult 2	44.8	43.7	42.4	0.627	0.535						
Total for Household	63.5	62.6	57.7	2.560	0.079						

Table 6.10 One-Way ANOVA for mean working hours and eating pattern groups during the week

The significant results for eating patterns during the week are as follows (Table 6.10);

- In households that always eat together as a family the mean working hours of Adult 2 and the household are significantly lower than in households who eat together less frequently.
- In households where only one adult and the children always eat together the mean household working hours were lower than those who sometimes ate like this
- In households where the adults never ate alone the main food provider worked fewer hours than in those households were the adults ate alone more often

6.2.4.2 Eating Patterns at the Weekend

The significant results for eating patterns at the weekend are as follows (Table 6.11):

- In households, where only one adult and the children always eat together the total household working hours are lower than in those households where only one adult and the children eat together less frequently.
- In households where the adult never eat alone the working hours for the main food provider and the household are lower than in those where the adults sometimes eat alone.

At the Weekend	Mean number of hours worked per week					Post Hoc Tests					
						Tukey's HSD			LSD		
Eating Together	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	25.1	26.4	29.5	0.895	0.409						
Adult 2	43.1	43.5	45.7	0.273	0.761						
Total for Household	59.9	63.2	71.0	2.544	0.079						
1 Adult & Children	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	23.1	25.8	24.6	1.051	0.351						
Adult 2	47.8	43.6	42.9	2.217	0.111						
Total for Household	45.3	62.0	61.3	15.075	0.000	•	•		•	•	
Children Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	19.6	25.9	24.4	1.128	0.325						
Adult 2	41.5	43.9	43.8	0.136	0.873						
Total for Household	54.3	62.2	61.7	0.477	0.621						
Adults Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	25.9	26.8	21.8	6.254	0.002			•			•
Adult 2	46.6	43.7	44.0	0.314	0.731						
Total for Household	67.4	63.8	58.3	3.435	0.033			•			•

Table 6.11 One-Way ANOVA for mean working hours and eating pattern groups at the weekend

6.2.5 Flexibility and Food Provision: Crosstabulation

The food provision groups, for both time and responsibility, were crosstabulated with the ability to work flexi-time for the main food provider and Adult 2. No significant differences were found in the division of responsibility for food shopping and preparation or for time spent in food shopping and preparation within the flexible and non-flexible work groups.

6.2.6 Flexibility and Food Consumption: Independent Samples t-test

An independent samples t-test was used to determine whether there was any difference between food consumption within the flexible and non-flexible work groups. The mean food group consumption, convenience food consumption, healthy eating score and food component scores were used. No significant differences were found between the mean values for all food consumption variables for the flexible and non-flexible work groups.

6.2.7 Flexibility and Eating Patterns: Crosstabulation

The eating pattern groups were crosstabulated with the ability to work flexi-time for the main food provider and Adult 2. No significant differences were found in the main meal eating patterns, during the week and at the weekend, for the flexible and non-flexible work groups.

6.2.8 Shift Work and Food Provision: Crosstabulation

The food provision groups were crosstabulated with the shift work groups for the main food provider and Adult 2. No significant differences were found in the division of responsibility for food shopping and preparation or in the amount of time spent in food shopping and preparation within the shift work and non-shift work groups.

6.2.9 Shift Work and Food Consumption: Independent Sample t-test

An independent samples t-test was used to determine whether there were any significant differences in food consumption between those who worked shifts and non-shift workers. The mean food group consumption, convenience food consumption, healthy eating score and food component scores were used. In the shift and non-shift work groups, no significant differences were found between the mean values for all food consumption variables.

6.2.10 Shift Work and Eating Patterns: Crosstabulation

The eating pattern groups were crosstabulated with the shift work groups for the main food provider and Adult 2. No significant differences were found in the main meal eating patterns, during the week and at the weekend, for the shift and non-shift work groups.

6.2.11 Summary and Initial Interpretation of Main Results

- There is no association between working hours, for the main food provider and other adult, and the time spent in food shopping and preparation.
- In households where the main food provider works longer hours, responsibility for food shopping and food preparation is shared more equally.
- In households where Adult 2 works longer hours, the main food provider takes greater sole responsibility for food shopping and preparation.
- No strong association was found between working hours and food group and convenience food consumption, healthy eating scores or food component scores.
- Households where family members ate together more frequently were associated with fewer working hours for Adult and the household as a whole.
- In households where the adults and children never eat separately at the weekends are associated with fewer hours worked by the household and the main food provider.
- No differences were found for any of the food behaviour variables for those who worked flexi-time or shift workers.

These results show no association between working hours and time spent in food preparation. The results in section 5.3.2.2 show that significantly less time is spent in food preparation during the week compared to that at the weekend. As the majority of the study population did not work at the weekend, it was assumed that the reduction in working hours would mean more time available for food preparation. However, this has not been supported by the results in this section. Does this mean that working hours are not a good indicator of the time available for food related activities? Is it valid to assume that increased working hours lead to "lack of time" for food provision? These questions will be discussed further in chapter seven.

Also of interest are the associations of working hours with division of responsibility for food provision and with eating patterns. Longer working hours have been associated with responsibility for food provision being shared more equally and more family meals being eaten separately but this does not imply causality. Longer working hours are associated with these changes in food behaviour, but this does not mean that they directly bring about these changes. In other words, the actual amount of time committed to work may be less important than the actual timing of those hours. For example, if the family meal is eaten at 6pm and Adult 2 works a 10 hour day from 9am-7pm the eating patterns within the family will become more fragmented; if Adult 2 works a 10 hour day from 7am-5pm the family will be able to eat together at 6pm. In this case it is not the number of hours worked which are important but rather the location of those hours within the day; the "timing" of the working hours. This will be discussed further in chapter seven.

6.3 Job Satisfaction & Food Behaviour

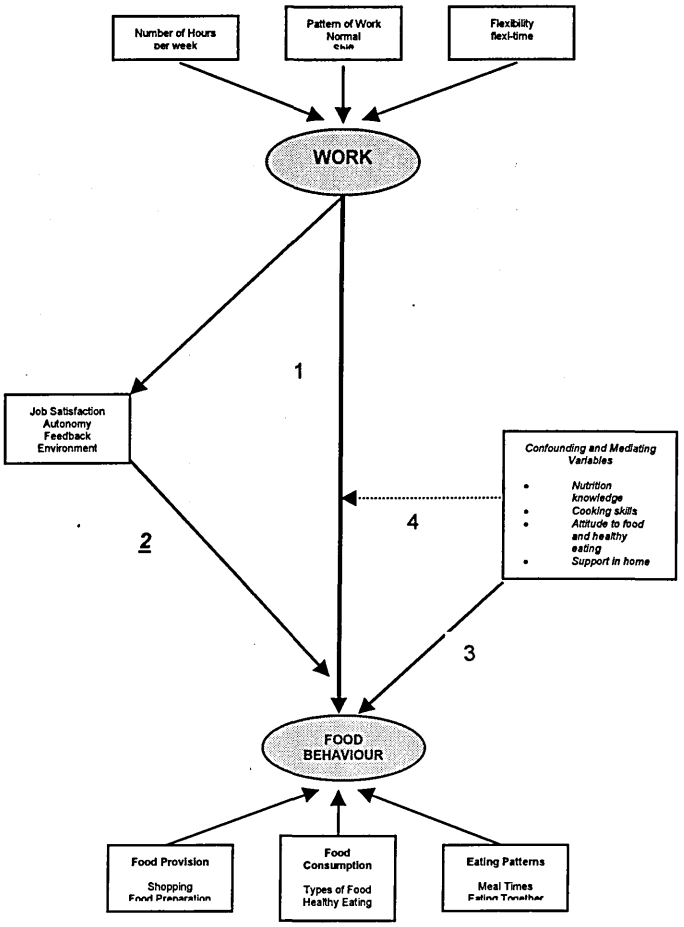


Figure 6.1 Model of the Hypothesised Relationships between Work and Food Behaviour

In this section, the relationship between job satisfaction and food behaviour will be explored: shown in Figure 6.1 as highlighted. In section 5.2 the relationship between work and job satisfaction was explored and it was found that the main food provider had significantly higher levels of job satisfaction than the other adult for all elements except reward. Therefore, autonomy, feedback and environment elements of job satisfaction will be explored in terms of their impact on food behaviour. Details on the statistical tests used in this section can be found in Chapter 4. The main hypotheses to be tested are as follows;

Hypotheses 3 - **Job Satisfaction and Food Behaviour**

Job satisfaction[b] will influence food behaviour of the household so that:

- as job satisfaction increases more time is spent food shopping and food preparation
- as job satisfaction increases the responsibility for food shopping and food preparation changes to accommodate work commitments
- as job satisfaction increases the consumption of convenience products decreases
- as job satisfaction increases food consumption changes and the balance of food groups within the diet becomes more health orientated
- as job satisfaction increases more meals are eaten together as a family

[b]**Job satisfaction is taken as a total score and individual scores for Autonomy, Feedback, Environment & Reward.**

6.3.1 Job Satisfaction and Food Provision: ANOVA

One way analysis of variance was used to compare the mean job satisfaction scores between the food provision groups, for time and division of responsibility; for example, to compare the mean job satisfaction of the main food provider in households who spent "less than 1hr", "1-2hrs", "2-3hrs" or "more than 3hrs" food shopping.

6.3.1.1 Time Spent in Food Shopping and Food Preparation: ANOVA

The average amounts of time spent in all food shopping trips and in food preparation, during the week and at the weekend, are detailed in sections 5.3.1.4 and 5.3.2.2. Tables 6.12, 6.13 and 6.14 show the mean job satisfaction scores within each of the food shopping and food preparation categories. To determine whether the job satisfaction of the adults within the household affects the time spent in food shopping and food preparation a one way analysis of variance (ANOVA) test was performed. The F statistic showed no significant differences.

Time spent Food Shopping per Week		Less than an hour	1-2 hours	2-3 hours	More than 3 hours	F	Sig.
Mean job satisfaction scores	Adult 1	69.8	69.7	71.8	70.7	0.734	0.532
	Adult 2	60.7	65.7	66.5	67.6	0.673	0.569

Table 6.12 One-Way ANOVA Time spent food shopping and average job satisfaction scores

Time spent in Food Preparation during the Week		Less than 30mins	30-60mins	More than 60mins	F	Sig.
Mean job satisfaction scores	Adult 1	70.1	71.5	66.2	2.010	0.135
	Adult 2	65.6	67.2	61.7	1.702	0.183

Table 6.13 One-Way ANOVA Time spent in food prep during the week and average job satisfaction scores

Time spent in Food Preparation at the Weekend		Less than 60mins	60-90mins	More than 90mins	F	Sig.
Mean job satisfaction scores	Adult 1	70.3	71.9	70.6	0.408	0.665
	Adult 2	66.3	65.0	67.1	0.336	0.715

Table 6.14 One-Way ANOVA Time spent in food prep at the weekend and average job satisfaction scores

6.3.1.2 Responsibility for Food Shopping and Food Preparation: ANOVA

One way analysis of variance was used to determine whether the mean job satisfaction scores for the main food provider and Adult 2 differed significantly within the food provision groups that represent division of responsibility for food shopping and preparation. Tables 6.15 to 6.17 show the mean number of hours worked within each of the food provision groups. The F

statistic was used to identify whether there were any significant differences between the groups and the post hoc tests highlight between which groups the differences lay.

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the main food shopping?		MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean Job Satisfaction	MFP	71.6	73.0	67.4	5.407	.005		•	•		•	•
	Adult 2	63.8	67.7	68.2	3.243	.040				•	•	

Table 6.15 One-Way ANOVA Division of responsibility for main food shopping and job satisfaction

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the top up food shopping?		MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean Job Satisfaction	MFP	71.7	74.6	68.5	6.204	.002			•		•	•
	Adult 2	62.9	68.9	69.0	6.080	.003	•	•		•	•	

Table 6.16 One-Way ANOVA Division of responsibility for top up food shopping and job satisfaction

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the food prep during the week?		MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean Job Satisfaction	MFP	69.9	70.4	70.8	1.598	.203						
	Adult 2	65.1	67.3	67.3	0.944	.390						

Table 6.17 One-Way ANOVA Division of responsibility for food prep during the week and job satisfaction

FOOD PROVISION GROUP		1	2	3			Tukey's HSD			LSD		
Who does the food prep at the weekend?		MFP alone	MFP+A2 helps	Both share	F	Sig	1/2	1/3	2/3	1/2	1/3	2/3
Mean Job Satisfaction	MFP	70.0	73.7	69.5	3.754	.024			•	•		•
	Adult 2	62.1	65.6	67.9	3.813	.023		•			•	

Table 6.18 One-Way ANOVA Division of responsibility for food prep at the weekend and job satisfaction

The above tables show that there are significant differences between the mean job satisfaction scores in all food provision groups except division of responsibility for food preparation during the week. LSD and Tukey's HSD reveal between which food provision groups there are significant differences in the mean job satisfaction scores. The results are as follows;

- In households where the division of responsibility for main and top up food shopping is equally shared, the main food provider has a lower mean job satisfaction score.
- The opposite is true for Adult 2; higher mean job satisfaction scores are associated with a more equal division of responsibility for main and top up food shopping.
- Food preparation at the weekend is shared more equally between the adults when the main food provider has lower job satisfaction scores and Adult 2 has higher scores.

In summary, a more equal division of responsibility for food shopping and food preparation is found where the main food provider has lower job satisfaction scores, also where Adult 2 has higher mean job satisfaction scores.

6.3.2 Correlation of Job Satisfaction with Food Group and Convenience Food Intakes and Healthy Eating Scores

The total job satisfaction scores for the main food provider and Adult 2 were correlated with the food group and convenience food intakes and the healthy eating score for each household.

		Job Satisfaction	
		Main Food Provider	Adult 2
Starchy Foods	Pearson Correlation	0.069	**0.101***
	Sig. (2-tailed)	0.111	**0.025**
	N	537	**498**
Fruit and Vegetables	Pearson Correlation	0.023	-0.014
	Sig. (2-tailed)	0.592	0.748
	N	537	498
Meat, Fish and Alternatives	Pearson Correlation	0.062	0.077
	Sig. (2-tailed)	0.151	0.087
	N	537	537
Dairy Products	Pearson Correlation	0.079	0.084
	Sig. (2-tailed)	0.066	0.060
	N	537	537
Sweet and Fatty Foods	Pearson Correlation	0.000	**0.113***
	Sig. (2-tailed)	0.995	**0.012**
	N	537	**498**
Convenience Foods	Pearson Correlation	-0.029	0.026
	Sig. (2-tailed)	0.504	0.567
	N	537	498
Healthy Eating Scores	Pearson Correlation	0.039	0.054
	Sig. (2-tailed)	0.373	0.231
	N	537	498

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 6.19 Correlation of Job Satisfaction with Food Groups, Convenience Food and Healthy Eating Score

Statistical analysis identified positive significant associations for the intake of starchy foods and sweet and fatty foods with the total job satisfaction scores of Adult two (p=0.026, p=0.012). This suggests that as the job satisfaction increases there is increased consumption of these foods but once again when the correlation coefficients are examined (r=0.101 and r=0.119 respectively) their small values suggest weak association.

6.3.3 Correlation of Autonomy, Feedback and Environment with Food Group and Convenience Food Intakes and Healthy Eating Scores

The job satisfaction scores for autonomy, feedback and environment for each adult were correlated with the food group and convenience food intakes and healthy eating scores for each household. The results are shown in Table 6.20.

		Job Satisfaction					
		Main Food Provider			Adult 2		
		AUT	FDB	ENV	AUT	FDB	ENV
Starchy Foods	Spearman	0.081	0.060	0.068	0.064	**0.089***	0.078
	Sig. (2-tailed)	0.062	0.166	0.114	0.157	**0.050**	0.084
	N	537	534	537	494	**486**	497
Fruit and Vegetables	Spearman	**0.086***	0.031	0.023	-0.038	-0.032	-0..028
	Sig. (2-tailed)	**0.046**	0.479	0.590	0.402	0.477	0.531
	N	**537**	534	537	494	486	497
Meat, Fish and Alternatives	Spearman	**0.085***	0.051	0.042	0.039	0.081	0.069
	Sig. (2-tailed)	**0.049**	0.242	0.328	0.392	0.073	0.122
	N	**537**	534	537	494	486	497
Dairy Products	Spearman	**0.100***	0.070	0.081	0.056	0.085	0.017
	Sig. (2-tailed)	**0.020**	0.109	0.060	0.214	0.061	0.710
	N	**537**	534	537	494	486	497
Sweet and Fatty Foods	Spearman	0.036	-0.009	0.004	0.058	0.074	0.081
	Sig. (2-tailed)	0.405	0.841	0.932	0.195	0.105	0.071
	N	537	534	537	494	486	497
Convenience Foods	Spearman	-0.042	-0.012	-0.013	0.033	0.052	0.031
	Sig. (2-tailed)	0.333	0.779	0.763	0.463	0.249	0.492
	N	537	534	537	494	486	497
Healthy Eating Scores	Spearman	0.060	0.010	0.049	-0.011	0.027	0.035
	Sig. (2-tailed)	0.166	0.826	0.261	0.803	0.550	0.430
	N	537	534	537	494	486	497

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 6.20 Correlation of Autonomy, Feedback and Environment Satisfaction Scores with Food Group and Convenience Food Intakes and Healthy Eating Scores for each Household

For the main food provider positive associations were found between the scores for autonomy and intake of fruit and vegetables, meat and fish and dairy products, which suggests that as autonomy scores increase so too do the consumption of these food items. For the other adult a positive association was found between the intake of starchy food and the score for feedback, which suggests that as their satisfaction with feedback increases so too does their consumption of starchy foods. These results will be discussed further in section 6.3.8.

6.3.4 Correlation of Total Job Satisfaction and Food Component Scores

The job satisfaction scores for the main food provider and Adult 2 were correlated with the food component scores for each household; see Table 6.21.

No significant associations were found for the job satisfaction of either adult with any of the food component scores.

		Job Satisfaction	
		Main Food Provider	Adult 2
Fresh Food, Fruit and Veg	Pearson Correlation	0.005	-0.007
	Sig. (2-tailed)	0.913	0.884
	N	537	498
Sweet Fatty Snacks	Pearson Correlation	-0.032	0.081
	Sig. (2-tailed)	0.458	0.071
	N	537	498
Rice and Pasta Ready Sauce	Pearson Correlation	0.068	0.068
	Sig. (2-tailed)	0.115	0.130
	N	537	498
Convenience Chips, beans, frozen veg	Pearson Correlation	-0.006	0.008
	Sig. (2-tailed)	0.887	0.863
	N	537	498
Meat pies and burgers	Pearson Correlation	0.015	0.002
	Sig. (2-tailed)	0.731	0.956
	N	537	498
Milk and Bread	Pearson Correlation	-0.023	-0.003
	Sig. (2-tailed)	0.589	0.950
	N	537	498
Puddings and Cream	Pearson Correlation	0.071	0.003
	Sig. (2-tailed)	0.098	0.945
	N	537	498

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 6.21 Correlation of Job Satisfaction with Food Component Scores

6.3.5 Correlation of Autonomy, Feedback and Environment with Food Component Scores

The job satisfaction scores for autonomy, feedback and environment for each adult were correlated with the food component scores for each household; see Table 6.22.

No significant associations were found for any of the job satisfaction items, for either adult, with the food component scores.

		Job Satisfaction					
		Main Food Provider			Adult 2		
		AUT	FDB	ENV	AUT	FDB	ENV
Wholegrains Fresh Food, Fruit and Veg	Spearman	0.072	0.014	-0.017	-0.035	-0.022	-0.045
	Sig. (2-tailed)	0.095	0.739	0.700	0.444	0.621	0.322
	N	537	534	537	494	486	497
Sweet Fatty Snacks	Spearman	-0.031	-0.060	-0.019	0.036	0.033	0.076
	Sig. (2-tailed)	0.468	0.167	0.655	0.446	0.467	0.090
	N	537	534	537	494	486	497
Rice and Pasta Ready Sauce	Spearman	0.072	0.022	0.020	0.039	0.044	0.021
	Sig. (2-tailed)	0.095	0.611	0.636	0.383	0.336	0.638
	N	537	534	537	494	486	497
Convenience Chips, beans, frozen veg	Spearman	0.011	-0.011	0.026	0.004	0.046	0.036
	Sig. (2-tailed)	0.795	0.796	0.549	0.934	0.312	0.426
	N	537	534	537	494	486	497
Meat pies and burgers	Spearman	0.020	0.011	-0.008	-0.006	-0.015	0.015
	Sig. (2-tailed)	0.637	0.800	0.860	0.899	0.748	0.735
	N	537	534	537	494	486	497
Milk and Bread	Spearman	-0.004	-0.006	-0.011	-0.030	-0.025	-0.045
	Sig. (2-tailed)	0.935	0.885	0.794	0.505	0.579	0.316
	N	537	534	537	494	486	497
Puddings and Cream	Spearman	-0.60	0.081	0.065	-0.009	0.004	0.017
	Sig. (2-tailed)	0.162	0.063	0.132	0.836	0.931	0.712
	N	537	534	537	494	486	497

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 6.22 Correlation of Autonomy, Feedback and Environment Satisfaction Scores with Food Component Scores for each Household

6.3.6 Job Satisfaction and Eating Patterns

One way analysis of variance was used to compare the mean job satisfaction scores between the eating pattern groups. For example, to compare the mean job satisfaction score of the main

food provider in households who "always", "sometimes" or "never" ate their main meal together as a family.

During the Week	Mean Job Satisfaction Score					Post Hoc Tests					
						Tukey's HSD			LSD		
Eating Together	**Always**	**Sometimes**	**Never**	**F**	**Sig.**	**A/S**	**A/N**	**S/N**	**A/S**	**A/N**	**S/N**
Main Food Provider	70.8	71.6	68.0	2.976	.052			•			•
Adult 2	64.9	67.2	65.3	0.963	.382						
1 Adult & Children	**Always**	**Sometimes**	**Never**	**F**	**Sig.**	**A/S**	**A/N**	**S/N**	**A/S**	**A/N**	**S/N**
Main Food Provider	70.4	70.2	71.4	0.369	.691						
Adult 2	66.7	66.3	65.9	0.066	.936						
Children Alone	**Always**	**Sometimes**	**Never**	**F**	**Sig.**	**A/S**	**A/N**	**S/N**	**A/S**	**A/N**	**S/N**
Main Food Provider	73.2	70.8	70.2	0.505	.604						
Adult 2	66.7	67.4	65.0	1.143	.320						
Adults Alone	**Always**	**Sometimes**	**Never**	**F**	**Sig.**	**A/S**	**A/N**	**S/N**	**A/S**	**A/N**	**S/N**
Main Food Provider	73.3	70.9	70.0	0.891	.441						
Adult 2	64.3	67.0	65.6	0.562	.570						

Table 6.23 One Way ANOVA for mean job satisfaction scores and eating pattern groups during the week

At the Weekend	Mean Job Satisfaction Scores					Post Hoc Tests					
						Tukey's HSD			LSD		
Eating Together	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	71.2	70.1	69.7	0.482	.618						
Adult 2	65.6	66.8	68.4	0.445	.641						
1 Adult & Children	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	68.1	71.2	70.7	0.839	.433						
Adult 2	67.5	66.1	66.1	0.077	.926						
Children Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	75.0	71.6	70.1	0.942	.391						
Adult 2	70.5	67.8	65.3	1.278	.280						
Adults Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Main Food Provider	75.9	70.6	70.5	0.674	.510						
Adult 2	61.8	67.2	65.7	0.731	.482						

Table 6.24 One-Way ANOVA for mean job satisfaction scores and eating pattern groups at the weekend

Tables 6.23 and 6.24 show the results for the AVOVA for job satisfaction within the eating pattern groups, during the week and at the weekend respectively.

Only one significant difference was identified for eating patterns during the week; in households that never eat together the main food provider had significantly lower mean job satisfaction scores than in household who eat together more frequently.

6.3.7 Summary and Initial Interpretation of Main Results

- There is no association between job satisfaction and time spent in food provision.
- Responsibility for food provision is shared more equally in households where the main food provider has lower job satisfaction scores and where Adult 2 has higher job satisfaction scores.
- Fruit and vegetables, meat and fish and dairy products all correlate positively with the autonomy scores for the main food provider.
- Starchy foods and sweet and fatty foods correlate positively with the total job satisfaction score for the main food provider.
- There was no significant association between any of the job satisfaction variables and the food component scores.
- Higher job satisfaction scores for the main food provider were found in households where the main family meal was eaten together during the week.

To interpret these findings a reminder of the results in section 5.2.6 is necessary:

- The working hours of the main food provider are negatively correlated with those of the Adult two.
- The main food provider's job satisfaction is negatively correlated with their working hours and positively correlated with the working hours of Adult two.

The more equal distribution of responsibility for food provision, that is found in households where the main food provider has a lower total job satisfaction score, may be explained by the increased working hours that are also associated with lower job satisfaction; supporting the results in section 6.2.1.2. In addition, the positive correlation between the main food provider's total job satisfaction and Adult two's working hours means that more equal distribution of responsibility is also found in households where Adult 2 works fewer hours; also supporting the results in section 6.2.1.2. In summary, responsibility for food shopping and food preparation is more equally shared in households where the main food provider works longer hours with lower job satisfaction and where Adult 2 works fewer hours.

The positive correlation of the main food provider's autonomy score and Adult two's total job satisfaction score with food consumption, for the food groups listed above, is contradictory to

the results in section 6.2.2. Increases in these job satisfaction variables would be associated with a decrease in the working hours of the main food provider yet no association was found between working hours and food consumption for any food groups shown in Table 6.8. Furthermore, the job satisfaction of Adult 2 is not associated with their working hours or those of the main food provider (see Table 5.11) so this too does not support the results in section 6.2.2. Finally, as increased job satisfaction for the main food provider is associated with fewer hours this also supports the result that in such cases the family meal is eaten together more frequently during the week. However, this is contradictory to the results in section 6.2.4.1 where eating together as a family is more frequent in households where Adult 2 works fewer hours; associated with a decrease in the main food provider's job satisfaction (see Table 5.11).

To conclude, it seems that some of the results in this section are contradictory to those presented earlier in this report. Job satisfaction, within the context of this research, has been used as a measure of work related stress. Just as the use of working hours as a measure of quantitative time availability was questioned in section 6.2.11, it is also appropriate to query the efficacy of using job satisfaction variables as indicators of work related stress. These issues will be discussed further in chapter seven.

6.4 Mediating Variables and Food Behaviour:

Nutrition Knowledge, Attitudes to Food & Nutrition and Cooking Skills

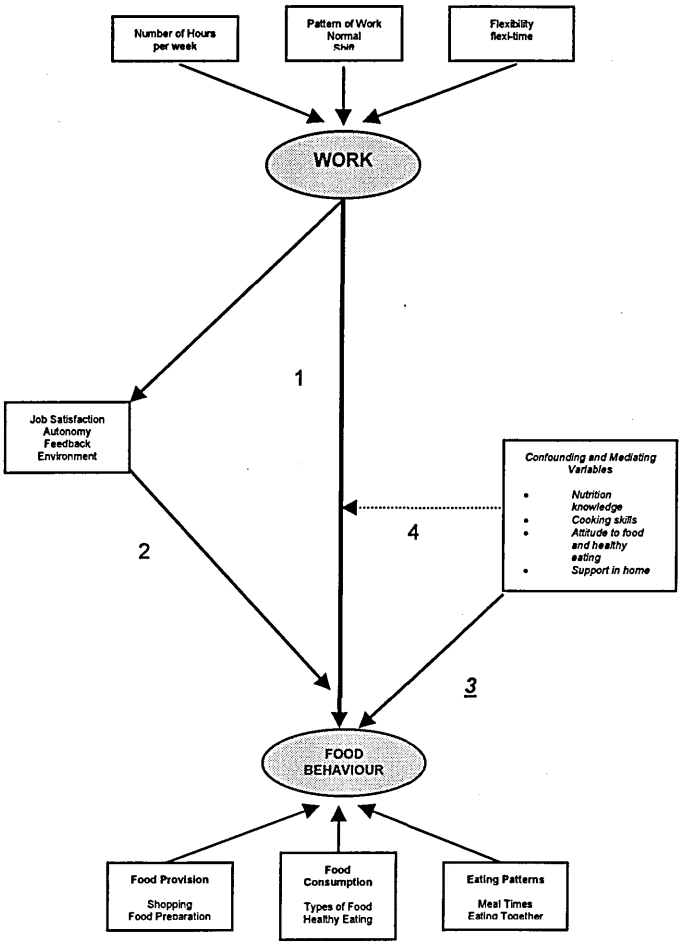


Figure 6.1 Model of the Hypothesised Relationships between Work and Food Behaviour

In this section the nutrition knowledge, attitudes towards food and nutrition and confidence in cooking skills of the main food provider are explored. The possible mediating affect that these variables may have on the relationship between work and food behaviour is shown in Figure 6.1. Their association with food provision, food consumption and eating patterns are considered.

Further details of the statistical tests used in this section can be found in chapter four.

The hypotheses to be tested are as follows;

Hypotheses 4 - **Nutrition Knowledge and Food Behaviour**

The nutrition knowledge of the main food provider will influence the food behaviour of the household such that:

- as nutrition knowledge increases more time is spent in food shopping and food preparation
- as nutrition knowledge increases the responsibility for food shopping and food preparation changes
- as nutrition knowledge increases the consumption of convenience products decreases

- as nutrition knowledge increases food consumption changes and the balance of food groups within the diet becomes more health orientated
- as nutrition knowledge increases more meals are eaten together as a family

Hypotheses 5 - **Attitude towards Food & Nutrition and Food Behaviour**

The attitude of the main food provider will influence the food behaviour of the household such that:

- a positive attitude leads to more time spent in food shopping and food preparation
- a positive attitude changes the responsibility for food shopping and food preparation within the household
- a positive attitude decreases the consumption of convenience products
- a positive attitude changes food consumption and the balance of food groups within the diet becomes more health orientated
- a positive attitude leads to more meals eaten together as a family

Hypotheses 6 - **Cooking Skills and Food Behaviour**

The cooking skills of the main food provider will influence the food behaviour of the household such that:

- as cooking skills increase more time is spent in food shopping and food preparation
- as cooking skills increase the responsibility for food shopping and food preparation changes
- as cooking skills increase the consumption of convenience products decreases
- as cooking skills increase food consumption changes and the balance of food groups within the diet becomes more health orientated
- as cooking skills increase more meals are eaten together as a family

6.4.1 Nutrition Knowledge, Attitude, Cooking Skills and Food Provision Activities

One way analysis of variance was used to compare the mean nutrition knowledge, attitude and cooking confidence scores between the food provision groups; for example, to compare the mean scores of the MFP for each of the above variables in households who spent "less than 1hr", "1-2hrs", "2-3hrs" or "more than 3hrs" food shopping.

6.4.1.1 Time Spent in Food Shopping and Food Preparation: ANOVA

One way analysis of variance (ANOVA) was carried out to determine whether the scores for nutrition knowledge, attitude and confidence in cooking skills were significantly different between the food provision groups for time spent in food shopping and preparation.

Time spent Food Shopping per Week		Less than an hour	1-2 hours	2-3 hours	More than 3 hours	F	Sig.
Mean score	Nutrition knowledge	18.0	17.6	18.0	17.6	0.764	0.514
	Attitude to food & nutrition	53.3	56.1	55.8	56.0	1.472	0.221
	Confidence in cooking	11.7	12.1	12.2	12.5	1.183	0.315

Table 6.25 One-Way ANOVA Time spent food shopping and average nutrition knowledge and attitude scores

Time spent in Food Preparation during the Week		Less than 30mins	30-60mins	More than 60mins	F	Sig.
Mean score	Nutrition knowledge	18.1	17.7	16.7	**4.993**	**0.007**
	Attitude to food & nutrition	55.8	56.1	54.9	0.853	0.427
	Confidence in cooking	12.1	12.3	12.1	0.246	0.782

Table 6.26 One-Way ANOVA Time spent in food preparation during the week and average nutrition knowledge and attitude scores

Time spent in Food Preparation at the Weekend		Less than 60mins	60-90mins	More than 90mins	F	Sig.
Mean score	Nutrition knowledge	17.9	17.6	17.4	1.493	0.225
	Attitude to food & nutrition	56.0	56.4	55.1	1.393	0.249
	Confidence in cooking	12.0	12.8	12.3	**5.520**	**0.004**

Table 6.27 One-Way ANOVA Time spent in food preparation at the weekend and average nutrition knowledge and attitude scores

The F statistic revealed two significant differences; first differences in the nutrition knowledge score for food preparation groups during the week and second differences in the scores for cooking confidence for food preparation groups at the weekend. To determine where these differences lay LSD and Tukey's HSD post hoc tests were used, the results were as follows;

- The main food provider had a significantly lower nutrition knowledge score in households where more than an hour was spent in food preparation during the week.
- The main food provider had a significantly higher score for cooking confidence in households that spent between an hour and an hour and a half in food preparation at the weekend, compared with those that spent less than an hour.

6.4.1.2 Responsibility for Food Shopping and Food Preparation: ANOVA

One way analysis of variance was also used to determine whether the responsibility for food provision activities was associated with the main food provider's scores for nutrition knowledge, attitudes and confidence in cooking skills. Tables 6.28 to 6.31 show the mean scores within each of the food provision groups related to division of responsibility.

The F statistic was used to identify whether there were any significant differences between the groups and the post hoc Tukey's HSD and LSD tests highlight between which groups the differences actually lie.

FOOD PROVISION GROUP	*1*	*2*	*3*			*Tukey's HSD*			*LSD*		
Who does the main food shopping?	MFP alone	MFP+A2 helps	Both share	F	sig	*1/2*	*1/3*	*2/3*	*1/2*	*1/3*	*2/3*
Nutrition knowledge	17.7	18.1	18.0	1.060	.347						
Attitude to food & nutrition	55.8	55.9	56.1	0.090	.914						
Confidence in cooking	12.2	12.2	12.4	0.506	.603						

Table 6.28 One-Way ANOVA Division of responsibility for main food shopping and mean nutrition knowledge, attitude and cooking confidence scores

FOOD PROVISION GROUP	*1*	*2*	*3*			*Tukey's HSD*			*LSD*		
Who does the top up food shopping?	MFP alone	MFP+A2 helps	Both share	F	sig	*1/2*	*1/3*	*2/3*	*1/2*	*1/3*	*2/3*
Nutrition knowledge	17.8	18.0	18.1	0.597	.551						
Attitude to food & nutrition	55.4	56.6	56.8	3.448	.033		•		•	•	
Confidence in cooking	11.9	12.4	12.4	3.290	.038				•	•	

Table 6.29 One-Way ANOVA Division of responsibility for top up food shopping and mean nutrition knowledge, attitude and cooking confidence scores

FOOD PROVISION GROUP	*1*	*2*	*3*			*Tukey's HSD*			*LSD*		
Who does the food prep during the week?	MFP alone	MFP+A2 helps	Both share	F	sig	*1/2*	*1/3*	*2/3*	*1/2*	*1/3*	*2/3*
Nutrition knowledge	17.7	17.7	18.6	4.812	.008		•	•		•	•
Attitude to food & nutrition	55.9	55.6	55.7	1.123	.326						
Confidence in cooking	12.2	12.3	12.2	0.142	.868						

Table 6.30 One-Way ANOVA Division of responsibility for food preparation during the week and mean nutrition knowledge, attitude and cooking confidence scores

FOOD PROVISION GROUP	1	2	3			Tukey's HSD			LSD		
Who does the food prep at the weekend?	MFP alone	MFP+A2 helps	Both share	F	sig	1/2	1/3	2/3	1/2	1/3	2/3
Nutrition knowledge	17.7	18.0	18.3	1.690	.186						
Attitude to food & nutrition	55.3	56.3	56.9	3.509	.031		•			•	
Confidence in cooking	12.0	12.6	12.2	2.547	.079						

Table 6.31 One-Way ANOVA Division of responsibility for food preparation at the weekend and mean nutrition knowledge, attitude and cooking confidence scores

The results are as follows;

- In households where the main food provider does the top up shopping on their own, the scores for attitude and cooking skills are lower than when the responsibility is shared more equally.
- In households where the food preparation during the week is shared more equally, the main food provider's nutrition knowledge score is significantly higher than when preparation is less equally shared.
- In household where the main food provider prepares the food alone at the weekend the attitude score is lower than where food preparation is shared.

6.4.2 Correlation of Nutrition Knowledge and Attitude Scores with Food Group and Convenience Food Intakes and Healthy Eating Scores

The correlation coefficients for the scores of nutrition knowledge, attitude and cooking confidence with food group and convenience food intakes and healthy eating scores are shown in Table 6.32.

Significant positive correlations were found between nutrition knowledge and consumption of starchy foods (p=0.009) and consumption of fruit and vegetables (p=0.001). The correlation coefficients are small (r=0.103 and r=0.125 respectively) but the scatter plots for these variables indicate that there is a weak association; suggesting that as nutrition knowledge increases so too does the consumption of these foods.

Positive correlations were also found between the attitude scores and the consumption of starchy foods (p=0.000), fresh fruit and vegetables (p=0.000), and dairy products (p=0.002), meat and fish (p=0.025) and the healthy eating score (p=0.016). The correlation between attitude and consumption of fruit and vegetables is of particular interest as the coefficient

(r=0.285) suggests stronger association than the other variables; so that as attitudes become more health orientated the consumption of fruit and vegetables increases.

The negative correlation between the attitude score and consumption of convenience products and positive correlation between cooking skills and consumption of fruit and vegetables both have small coefficients (r=-0.095 and r=0.086 respectively) and therefore the probability that association occurred by chance is high.

		Nutrition Knowledge	Attitude to Food and Nutrition	Confidence in Cooking Skills
Starchy Foods	Pearson Correlation	**0.103****	**0.161****	-0.031
	Sig. (2-tailed)	**0.009**	**0.000**	0.429
	N	**642**	**642**	642
Fruit and Vegetables	Pearson Correlation	**0.125****	**0.285****	**0.086***
	Sig. (2-tailed)	**0.001**	**0.000**	**0.029**
	N	**642**	**642**	**642**
Meat, Fish and Alternatives	Pearson Correlation	0.049	**0.088***	0.022
	Sig. (2-tailed)	0.218	**0.025**	0.571
	N	642	**642**	642
Dairy Products	Pearson Correlation	0.046	**0.121****	0.012
	Sig. (2-tailed)	0.249	**0.002**	0.753
	N	642	**642**	642
Sweet and Fatty Foods	Pearson Correlation	0.004	-0.046	-0.037
	Sig. (2-tailed)	0.917	0.240	0.351
	N	642	642	642
Convenience Foods	Pearson Correlation	0.018	**-0.095***	-0.052
	Sig. (2-tailed)	0.654	**0.016**	0.191
	N	642	**642**	642
Healthy Eating Scores	Pearson Correlation	0.055	**0.095***	0.032
	Sig. (2-tailed)	0.165	**0.016**	0.424
	N	642	**642**	642

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 6.32 Correlation of Scores for Nutrition Knowledge, Attitude and Cooking Confidence with Food Group Intakes, Convenience Food Intakes and Healthy Eating Scores

6.4.3 Correlation of Nutrition Knowledge and Attitude with Food Component Scores

Correlation coefficients for nutrition knowledge, attitude and cooking confidence with food component scores are shown in Table 6.33. There were positive correlations between the nutrition knowledge and components 1 and 3; associated with the consumption of fresh foods, fruit and vegetables and rice, pasta and ready made sauces (r=0.156 and r=0.095 respectively). The correlation between nutrition knowledge and component score 1 suggests a weak association between knowledge and increased consumption of whole foods, fruit and vegetables. There was a negative association between the nutrition knowledge scores and component 5; associated with the consumption of meat pies and burgers. But the correlation coefficient is small (r=-0.088) so it is unlikely that there is any real association.

		Nutrition Knowledge	Attitudes to Food and Nutrition	Confidence in Cooking Skills
Whole Food, Fruit and Veg	Pearson Correlation	**0.156****	**0.341****	**0.088***
	Sig. (2-tailed)	**0.000**	**0.000**	**0.026**
	N	**642**	**642**	**642**
Sweet Fatty Snacks	Pearson Correlation	0.024	0.041	-0.030
	Sig. (2-tailed)	0.537	0.296	0.443
	N	642	642	642
Rice and Pasta Ready Sauce	Pearson Correlation	**0.095***	**0.137****	0.054
	Sig. (2-tailed)	**0.016**	**0.001**	0.176
	N	**642**	**642**	642
Convenience Chips, beans, frozen veg	Pearson Correlation	-0.028	-0.076	**-0.127****
	Sig. (2-tailed)	.0473	0.054	**0.001**
	N	642	642	**642**
Meat pies and burgers	Pearson Correlation	**-0.088***	**-0.135****	-0.011
	Sig. (2-tailed)	**0.026**	**0.001**	0.784
	N	**642**	**642**	642
Milk and Bread	Pearson Correlation	0.015	0.012	-0.010
	Sig. (2-tailed)	0.700	0.755	0.796
	N	642	642	642
Puddings and Cream	Pearson Correlation	-0.015	-0.056	0.000
	Sig. (2-tailed)	0.712	0.160	0.996
	N	642	642	642

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 6.33 Correlation of Nutrition Knowledge, Attitude and Cooking Skills with Food Component Scores

The attitude scores are positively correlated with food components 1 and 3 and negatively correlated with component 5. The correlation coefficients imply that there is a weak association with component 3 (r=0.137) but much stronger association with component 1 (r=0.341); thus suggesting that as attitudes become more health orientated consumption of whole foods, fruit and veg and rice, pasta and sauces increase. The correlation coefficient for component 5 (r=-0.135) also suggests a weak association between more health orientated attitudes and decreased consumption of meat pies and burgers.

The scores for confidence in cooking skills are positively correlated with component 1 (whole food and fruit and veg) although the association is weak (r=0.088). There is also a negative correlation (r=-0.127) between confidence in cooking skills and component 4; so that increased confidence in cooking skills is weakly associated with decreased consumption of convenience products, chips, beans and frozen veg.

6.4.4 Eating Patterns and Nutrition Knowledge, Attitude and Confidence in Cooking Skills

One way analysis of variance was used to compare the mean scores for nutrition knowledge, attitude and cooking confidence between the eating pattern groups. Tables 6.34 and 6.35 show the results for the AVOVA of the scores and the different eating pattern groups during the week and at the weekend respectively. The F statistic is shown to highlight significant differences in scores and LSD and Tukey's HSD post hoc test results are also shown to highlight where significant differences have been identified between the groups.

6.4.4.1 Eating Patterns during the Week

There are few significant results for the ANOVA - see Table 6.34. In households where one adult and the children sometimes eat alone or where the adults sometimes eat alone the nutrition knowledge scores for the main food provider are higher. However, as the sample is unequally distributed between the three eating pattern groups Levene's test for homogeneity of variance is not valid and thus it is unlikely that the differences are truly significant.

During the Week	Mean number of hours worked per week					Post Hoc Tests					
						Tukey's HSD			LSD		
Eating Together	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	17.63	17.69	18.14	1.440	.238						
Attitude	55.59	56.17	55.64	0.649	.523						
Cooking Confidence	12.46	11.99	12.28	2.486	.084						
1 Adult & Children	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	17.40	18.16	17.51	**4.218**	**.015**			•	•		•
Attitude	55.17	56.50	55.49	2.698	.068						
Cooking Confidence	12.07	12.15	12.31	0.508	.602						
Children Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	17.88	18.04	17.56	2.022	.113						
Attitude	57.19	56.28	55.46	1.949	.143						
Cooking Confidence	12.81	12.24	12.11	1.192	.304						
Adults Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	17.66	18.10	17.51	**2.904**	**.056**			•			•
Attitude	56.14	56.17	55.60	0.658	.518						
Cooking Confidence	12.43	12.07	12.26	0.707	.494						

Table 6.34 One-Way ANOVA Eating Patterns in the week & nutrition knowledge, attitude & cooking confidence

At the Weekend	Mean number of hours worked per week					Post Hoc Tests					
						Tukey's HSD			LSD		
Eating Together	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	17.79	18.14	16.80	**6.069**	**.002**		•	•		•	•
Attitude	56.06	56.05	54.70	1.724	.179						
Cooking Confidence	12.49	11.91	11.64	**6.800**	**.001**	•	•		•	•	
1 Adult & Children	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	17.39	18.01	17.72	1.207	.300						
Attitude	54.15	56.07	56.06	2.628	.073						
Cooking Confidence	11.90	12.21	12.23	0.524	.592						
Children Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	17.83	18.09	17.64	1.464	.232						
Attitude	55.83	55.96	55.85	0.024	.977						
Cooking Confidence	11.00	12.22	12.20	0.794	.452						
Adults Alone	Always	Sometimes	Never	F	Sig.	A/S	A/N	S/N	A/S	A/N	S/N
Nutrition Knowledge	18.60	18.05	17.61	1.987	.138						
Attitude	56.00	55.92	55.86	0.008	.992						
Cooking Confidence	11.70	12.20	12.20	0.225	.799						

Table 6.35 One-Way ANOVA Eating Patterns at weekend & nutrition knowledge, attitude & cooking confidence

6.4.4.2 Eating Patterns at the Weekend

Once again there are few significant results shown in Table 6.35, but the F statistic and post hoc tests do reveal some differences between nutrition knowledge and cooking confidence. The main food provider's nutrition knowledge score is significantly lower in households where the main meal is never eaten together. Also the confidence in cooking skills is higher in households that always eat the main meal together.

6.4.5 Summary and Initial Interpretation of Main Results

In this section characteristics of the main food provider have been considered in terms of their effect on food behaviour. There are two perspective to consider (both of which are shown in Figure 6.1); firstly, these variables may have a direct association with food behaviour; secondly, they may act as mediating variables in the association between work and food behaviour.

- Lower nutrition knowledge scores were associated with more time spent in food preparation during the week; higher nutrition knowledge scores were associated with shared responsibility for food preparation during the week.
- Lower attitude scores were associated with the main food provider taking most responsibility for food shopping and food preparation during the week.
- Higher nutrition knowledge scores are associated with increased consumption of fruit and vegetables, starchy foods, whole foods, rice pasta and sauces and decreased consumption of meat pies and burgers; this suggests that nutrition knowledge is associated with a healthier pattern of food consumption.
- Higher attitude scores were associated with increased consumption of all food groups except sweet and fatty foods, higher healthy eating scores, whole foods, rice, pasta and sauces and with decreased consumption of convenience foods, meat pies and burgers; this suggests that more health orientated attitudes are associated with healthier patterns of food consumption and a more balanced diet (compared to COMA (1994) recommendations).
- Greater confidence in cooking skills was associated with increased consumption of fruit, vegetables and whole foods; decreased consumption of convenience products, chips, beans and frozen vegetables.

The results in this section indicate that the health orientation of the main food provider's knowledge, attitudes and skills are important determinants of food consumption. They may also be important in determining the amount of time and division of responsibility for food provision; however, as only the main food provider has been considered further information would be required about the knowledge, attitudes and skills of the other adult.

It is also possible that these factors significant enough to override the impact of work on food behaviour. For example, time constraints and stress resulting from work may be lesser considerations if the main food provider prioritises health orientated food behaviour; the results presented here do not support this conjecture and additional data would be required to substantiate this.

6.5 Confounding Variables: Income, Education and Paid and Unpaid Help in the Home

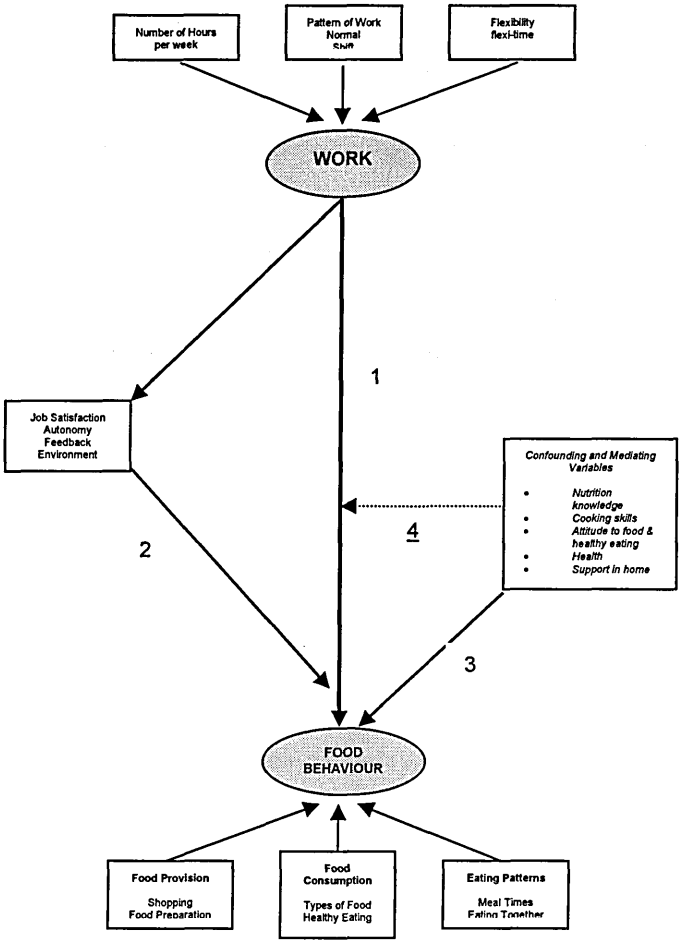


Figure 6.1 Model of the Hypothesised Relationships between Work and Food Behaviour

Income and support within the home, either as paid or unpaid help, may act as confounding variables in the relationship between work and food behaviour. Education may also affect food behaviour directly or by influencing the intervening variables that were explored in the previous section. Therefore, income, education and support in the home are explored in terms of their association with the work, food behaviour and intervening variables. The results for the distribution of income within the study population are shown in section 5.1.5. For the analysis in this section, the two highest income categories have been combined. Details of the main food provider's level of education are given in section 5.1.7; details of the support available within the home, from both paid and unpaid sources are given in section 5.3.5. The hypotheses developed to explore these associations are as follows;

Hypotheses 7 - **Income, Work and Food Behaviour**

The total household income will influence the work and food behaviour of the household such that:

- higher income will result from longer working hours and higher levels of job satisfaction
- higher income households will have a more balanced diet and increased consumption of healthy food items, such as fresh fruit and vegetables

- higher income households will be more likely to use paid help within the home for household responsibilities

Hypotheses 8 - **Education, Work and Food Behaviour**

The educational status of the main food provider will affect the work and food behaviour of the household such that:

- higher levels of education will lead to increased working hours and higher levels of job satisfaction for the main food provider
- higher levels of education in the main food provider will mean that households will have a more balanced diet and increased consumption of healthy food items, such as fresh fruit and vegetables
- higher levels of education in the main food provider will be associated with higher nutrition knowledge, more health orientated attitudes to food and nutrition and greater confidence in cooking skills

Hypotheses 9 - **Formal Nutrition Education and Food Behaviour**

The level of formal nutrition education received by the main food provider will affect the work and food behaviour of the household such that:

- having formal nutrition education will lead to a more balanced diet and increased consumption of healthy food items, such as fresh fruit and vegetables
- having formal nutrition education will be associated with higher levels of nutrition knowledge, more health orientated attitudes to food and nutrition and greater confidence in cooking skills

Hypotheses 10 - **Support within the Home and Food Behaviour**

Support within the home will influence the food behaviour of the household such that:

- the more support there is within the home less time is spent in food shopping and food preparation
- support within the home changes the responsibility for food shopping and food preparation
- support within the home decreases the consumption of convenience products
- support within the home changes food consumption and the balance of food groups within the diet becomes more health orientated
- support within the home means that more meals are eaten together as a family

6.5.1 Income and Working Hours

Analysis of variance was used to determine whether there were significant differences in the mean number of hours worked per week, for the main food provider, Adult 2 and household, between each of the income groups.

Average Household Income		Less than £15,000	£15,000-£30,000	£30,000-£45,000	More than £45,000	F	Sig.
Mean number of hours worked per week	Adult 1	23.7	25.6	26.8	30.8	4.304	0.005
	Adult 2	40.7	42.8	43.8	45.6	2.004	0.113
	Household	43.1	58.9	65.5	69.6	**31.982**	**0.000**

Table 6.36 One-Way ANOVA Income and Working Hours

The F statistic revealed significant differences between in the working hours of the main food provider and total household hours between the income groups. LSD and Tukey's HSD post hoc tests located the differences between the groups as follows:

- The mean working hours of the main food provider were significantly higher in households that earn more than £45,000.
- The mean total household hours were significantly higher in households that earn £30,000-£45,000 and more than £45,000.

The differences in household hours may be partially explained by the inclusion of single and dual earner households.

6.5.2 Income and Food Consumption

Analysis of variance was used to compare the mean scores for food group and convenience food consumption, healthy eating and food components between the income groups.

Food Groups	Less than £15,000	£15,000-£30,000	£30,000-£45,000	More than £45,000	F	Sig.
Starchy Foods	28.2	28.0	29.7	28.4	**2.550**	**0.055**
Fruit and Vegetables	22.8	24.3	25.3	25.5	**3.899**	**0.009**
Dairy Products	16.4	17.0	17.4	17.1	0.898	0.442
Meat, Fish and Alternatives	19.6	19.9	19.6	18.8	0.773	0.509
Sweet and Fatty Foods	42.6	42.0	42.1	40.3	0.737	0.530
Convenience Foods	4.5	4.6	4.8	4.5	0.371	0.774
Healthy Eating Score	3.0	3.1	3.3	3.5	**5.233**	**0.001**

Table 6.37 One-Way ANOVA Income and Food Group & Convenience Consumption and Healthy Eating Scores

The F statistic highlights two significant differences between the income groups and food group consumption; see Table 6.37. Post hoc tests (LSD and Tukey's HSD) revealed that consumption of fruit and vegetables was significantly lower in households where the total income was less than £15,000 and the healthy eating scores were significantly higher in households where the total income was greater than £30,000.

Food Component Scores	Less than £15,000	£15,000-£30,000	£30,000-£45,000	More than £45,000	F	Sig.
Fresh Food, Fruit and Veg	-0.30	0.02	0.15	0.19	5.603	0.001
Sweet Fatty Snacks	-0.07	0.02	0.06	-0.10	0.616	0.605
Rice, Pasta and Ready Sauces	-0.26	-0.04	0.21	0.07	5.306	0.001
Convenience - chips, beans, frozen veg	0.28	0.00	-0.10	-0.35	6.485	0.000
Meat pies and burgers	0.16	0.02	-0.73	-0.23	2.442	0.063
Milk and Bread	0.17	0.00	0.05	-0.19	0.827	0.479
Puddings and Cream	-0.01	0.01	-0.04	0.05	0.140	0.936

Table 6.38 One-Way ANOVA Income and Food Component Scores

For the food component scores the F statistic revealed three significant differences between the income groups. Consumption of fresh and whole foods, fruit and vegetables was significantly lower in households where the total income was less than £15,000. Consumption of rice, pasta and ready made sauces was lower in household where the total income was less than £30,000. Consumption of convenience foods, chips, baked beans and frozen vegetables were higher in households where the total income was less £30,000.

These results show that within the study population higher income is associated with increased consumption of healthier food; fruit, vegetables, whole foods, rice and pasta. Lower income groups are associated with increased consumption of less healthy foods; chips, baked beans, frozen and convenience products. Additionally, the balance of the diet, compared with the COMA (1994) recommendations, is healthier in higher income groups.

6.5.3 Income and Job Satisfaction

Analysis of variance was used to determine whether there were any significant differences in job satisfaction scores, for the MFP and A2, between the income categories. The F statistic revealed only one significant difference; a significant difference was identified between the income groups for the reward satisfaction score of Adult two.

Total Job Satisfaction	Less than £15,000	£15,000-£30,000	£30,000-£45,000	More than £45,000	F	Sig.
MFP	71.7	69.7	71.5	71.9	0.736	0.531
Adult 2	65.3	65.0	67.2	68.5	0.879	0.452
Job Satisfaction - Autonomy	**Less than £15,000**	**£15,000-£30,000**	**£30,000-£45,000**	**More than £45,000**	**F**	**Sig.**
MFP	20.5	20.2	20.6	20.9	0.633	0.594
Adult 2	19.6	19.1	19.4	19.8	0.456	0.713
Job Satisfaction - Feedback	**Less than £15,000**	**£15,000-£30,000**	**£30,000-£45,000**	**More than £45,000**	**F**	**Sig.**
MFP	18.6	17.8	18.1	18.2	0.421	0.738
Adult 2	16.6	16.6	16.8	17.1	0.144	0.934
Job Satisfaction - Environment	**Less than £15,000**	**£15,000-£30,000**	**£30,000-£45,000**	**More than £45,000**	**F**	**Sig.**
MFP	20.4	19.2	19.8	19.7	2.036	0.108
Adult 2	18.4	17.9	18.2	18.9	0.710	0.546
Job Satisfaction - Reward	**Less than £15,000**	**£15,000-£30,000**	**£30,000-£45,000**	**More than £45,000**	**F**	**Sig.**
MFP	12.2	12.5	12.6	13.0	0.642	0.588
Adult 2	10.6	11.5	12.8	12.7	**4.578**	**0.004**

Table 6.39 One-Way ANOVA Income and Job Satisfaction

Post hoc tests revealed that Adult 2's satisfaction score for reward was significantly higher when the total household income was over £30,000. As the reward element includes the score for satisfaction with pay, this suggests that higher income leads to greater satisfaction with pay.

6.5.4 Education, Working Hours and Job Satisfaction

Analysis of variance was also used to determine whether the mean number of working hours and mean job satisfaction scores were significantly different between educational groups for the main food provider - Table 6.40.

	1	*2*	*3*			*Tukey's HSD*			*LSD*		
Education	**Secondary**	**Further**	**Higher**	**F**	**sig.**	*1/2*	*1/3*	*2/3*	*1/2*	*1/3*	*2/3*
Working Hours	25.0	25.4	27.7	2.717	0.067						
Job Satisfaction	70.6	69.7	71.2	0.409	0.664						

Table 6.40 One-Way ANOVA for Working hours and Job Satisfaction

The results show that there were no significant differences between the educational groups for working hours or job satisfaction.

6.5.5 Education and Food Consumption

Differences between the education groups were also considered for the food consumption variables. Tables 6.41 and 6.42 show the ANOVA results for the food groups and food component scores between the educational groups.

Food Groups	1	2	3			Tukey's HSD			LSD		
	Secondary	Further	Higher	F	sig.	1/2	1/3	2/3	1/2	1/3	2/3
Starchy Foods	28.3	29.2	28.3	0.977	0.377						
Fruit and Vegetables	23.0	25.1	25.9	12.40	0.000	•	•		•	•	
Dairy Products	16.6	17.4	17.1	1.534	0.216						
Meat and Fish	19.6	21.1	19.1	8.431	0.000	•		•	•		•
Sweet and Fatty Foods	42.5	43.4	40.9	3.063	0.047			•			•
Convenience Foods	4.6	5.0	4.5	1.399	0.248						
Healthy Eating Score	3.1	3.1	3.3	2.438	0.088						

Table 6.41 One-Way ANOVA Education and Food Group and Convenience Consumption and Healthy Eating Scores

The F statistic revealed significant differences for three of the food groups. Post hoc tests revealed the following results:

- Consumption of fruit and vegetables was lower when the main food provider had been educated to secondary level.
- Consumption of meat and fish and sweet and fatty foods was higher when the main food provider had been educated to secondary level.

Food Component Scores	1	2	3			Tukey's HSD			LSD		
	Secondary	Further	Higher	F	sig.	1/2	1/3	2/3	1/2	1/3	2/3
Fresh Food, Fruit & Veg	-0.23	0.17	0.22	15.70	0.000	•	•		•	•	
Sweet Fatty Snacks	0.05	0.02	-0.06	0.680	0.507						
Rice, Pasta & Sauces	-0.06	0.06	0.05	1.062	0.346						
Chips, beans, frozen veg	0.10	0.14	-0.24	9.495	0.000		•	•		•	•
Meat pies and burgers	0.10	0.10	-0.18	5.940	0.003		•	•		•	•
Milk and Bread	0.11	0.03	-0.13	3.516	0.030		•			•	
Puddings and Cream	-0.06	-0.02	0.09	1.270	0.282						

Table 6.42 One-Way ANOVA Education and Food Component Scores

The following results were revealed by the post hoc tests for variation of food component scores between the education groups:

- Consumption of whole foods, fruit and vegetables was lower in households where the main food provider had been educated to secondary level.
- Consumption of chips, beans, frozen vegetables, meat pies, burgers, milk and white bread was lower in households where the main food provider had been educated beyond secondary level.

6.5.6 Nutrition Education and Food Consumption

The main food provider was asked to state whether they had received any formal nutrition education - the results are shown in section 5.5. An independent samples t-test was used to determine whether there were any significant differences in food consumption groups and food component scores for those who had had no formal nutrition education and those who had; the results are shown in Tables 6.43 and 6.44.

Food Groups	Formal Nutrition Education		t	Sig. (2-tailed)
	Yes	*No*		
	N = 383	*N = 259*		
Starchy Foods	28.62	28.40	0.405	0.685
Fruit and Vegetables	24.67	23.89	1.431	0.153
Dairy Products	17.42	16.27	**2.806**	**0.005****
Meat and Fish	20.08	19.17	**2.337**	**0.020***
Sweet and Fatty Foods	42.89	41.99	**2.329**	**0.020***
Convenience Foods	4.55	4.78	-0.917	0.359
Healthy Eating Score	3.18	3.11	0.965	0.335

Table 6.43 Formal Nutrition Education and Food Group and Convenience Consumption and Healthy Eating Scores - Independent Samples t-test

Food Component Scores	Formal Nutrition Education		t	Sig. (2-tailed)
	Yes	*No*		
	N = 383	*N = 259*		
Fresh Food, Fruit & Veg	0.037	-0.055	1.142	0.254
Sweet Fatty Snacks	0.081	-0.119	**2.508**	**0.012****
Rice, Pasta & Sauces	-0.010	0.016	-0.325	0.745
Chips, beans, frozen veg	-0.019	0.029	-0.610	0.542
Meat pies and burgers	-0.003	0.005	**-0.101**	0.920
Milk and Bread	-0.002	0.003	-0.055	0.956
Puddings and Cream	0.003	-0.005	0.095	0.924

Table 6.44 Formal Nutrition Education and Food Component Scores - Independent Samples t-test

Those who had received some form of nutrition education had higher consumption of dairy products, meat and fish and sweet and fatty foods. This is an unexpected result and will be discussed further in the summary at the end of this section.

6.5.7 Nutrition Education, Nutrition Knowledge, Attitudes, Cooking Skills

The main food provider's nutrition knowledge, attitude and cooking confidence scores were compared between the formal nutrition education groups; the results are shown in Table 6.45.

Main Food Provider's Scores	Formal Nutrition Education			
	Yes	*No*	t	Sig. (2-tailed)
	N = 383	*N = 259*		
Nutrition Knowledge	18.07	17.34	3.032	0.003**
Attitude to Food and Nutrition	56.29	55.28	2.012	0.045**
Confidence in Cooking Skills	12.38	11.92	2.442	0.015**

Table 6.45 Formal Nutrition Education and Nutrition Knowledge, Attitude and Cooking Confidence Scores - Independent Samples t-test

The scores for nutrition knowledge, attitude and confidence in cooking skills were significantly higher in those who had received some form of nutrition education; see 6.5.11.

6.5.8 Paid and Unpaid Help in the Home and Working Hours

Again an independent samples t-test was used to see if there were any significant differences between the working hours in household that had paid and unpaid help in the home. The results in Table 6.46 show that where the main food provider works longer hours they more likely to have support within the home, both paid and unpaid.

Mean Working Hours	Paid Help		t	Sig.	Unpaid Help		t	Sig.
	Yes	*No*		2-tailed	*Yes*	*No*		2-tailed
Main Food Provider	31.8	25.2	4.48	0.000**	28.6	25.2	2.857	0.004**
Adult 2	45.1	42.8	1.562	0.119	42.2	43.4	-1.022	0.307
Total Household Hours	70.0	57.3	4.956	0.000**	61.7	58.1	1.795	0.073

Table 6.46 Paid and Unpaid Help in the Home and Working Hours - Independent Samples t-test

6.5.9 Paid and Unpaid Help in the Home and Job Satisfaction

An independent sample t-test revealed that household that received unpaid help in the home the main food provider had significantly higher job satisfaction scores.

Mean Job Satisfaction	Paid Help		t	Sig.	Unpaid Help		t	Sig.
	Yes	*No*		2-tailed	*Yes*	*No*		2-tailed
Main Food Provider	71.2	70.5	0.377	0.706	73.0	69.8	**2.213**	**0.027****
Adult 2	67.1	66.0	0.477	0.633	66.4	66.0	0.186	0.852

Table 6.47 Paid and Unpaid Help in the Home and Job Satisfaction - Independent Samples t-test

Once again contradictory results have been found; the main food provider was found to have higher job satisfaction scores when they worked fewer hours (see section 5.2.6); higher job satisfaction and longer working hours for the main food provider are both associated with unpaid help in the home.

6.5.10 Paid and Unpaid in the Home and Food Behaviour

Analysis of variance was used to look for differences in food groups and component scores for those who had paid and unpaid help; results are given in Tables 6.48 and 6.49.

Food Groups	Paid Help		t	Sig.	Unpaid Help		t	Sig.
	Yes	*No*		2-tailed	*Yes*	*No*		2-tailed
Starchy Foods	27.8	28.6	-1.020	0.308	28.9	28.4	0.830	0.407
Fruit and Vegetables	25.8	24.1	**2.014**	**0.044****	24.2	24.4	-0.330	0.742
Dairy Products	16.9	16.9	-0.157	0.875	16.9	16.9	-0.015	0.988
Meat and Fish	19.6	19.7	-0.129	0.896	**20.6**	**19.5**	**2.423**	**0.016****
Sweet and Fatty Foods	40.2	42.4	**-2.305**	**0.023****	**43.0**	**41.9**	1.234	0.218
Convenience Foods	4.97	4.60	1.012	0.312	**5.08**	**4.51**	**1.992**	**0.047****
Healthy Eating Score	3.22	3.14	0.800	0.426	3.11	3.16	-0.491	0.624

Table 6.48 Paid and Unpaid Help in the Home Food Group and Convenience Consumption and Healthy Eating Scores - Independent Samples t-test

In households that received paid help consumption of fresh fruit, vegetables and whole foods was higher; consumption of sweet fatty foods, chips, baked beans and convenience food was lower in these households. This may be related more to income than support within the home; higher income households are more likely to have paid help in the home. The same patterns in food consumption have been identified in households with higher income - see section 6.5.6.

Food Component Scores	Paid Help		t	Sig.	Unpaid Help		t	Sig.
	Yes	*No*		2-tailed	*Yes*	*No*		2-tailed
Fresh Food, Fruit & Veg	0.308	-0.043	2.949	0.003**	0.015	-0.005	0.219	0.827
Sweet Fatty Snacks	-0.068	0.009	-0.651	0.515	0.135	-0.040	1.869	0.062
Rice, Pasta & Sauces	0.055	-0.008	0.525	0.600	0.027	-0.008	0.368	0.713
Chips, beans, frozen veg	-0.333	0.047	-3.188	0.002**	0.090	-0.027	1.244	0.214
Meat pies and burgers	-0.168	0.024	-1.804	0.074	0.087	-0.026	1.201	0.230
Milk and Bread	-0.126	0.018	-1.194	0.233	-0.005	0.002	-0.076	0.940
Puddings and Cream	0.019	-0.002	0.188	0.851	-0.104	0.031	-1.432	0.153

Table 6.49 Paid and Unpaid Help in the Home and Food Component Scores - Independent Samples t-test

Consumption of meat and fish and convenience foods was higher in households that had unpaid support within the home. There are no obvious explanations for these results. However, one of the main sources of unpaid help is from grandparents so perhaps more traditional food consumption patterns, meals based around meat, vegetables and potatoes, are evident in these household. Another main source of unpaid help is from childminders/babysitters; in this situation, if the parents are not around at meal times more convenience products may be relied upon. These explanations are purely speculative and would need further research to be substantiated.

6.5.11 Summary and Initial Interpretation of Main Results

The results in this section raise additional questions about the nature of the data that has been collected and the validity. The main results from this section are as follows:

- Higher income is associated with longer working hours and greater satisfaction with pay.
- Healthier patterns of food consumption were found in households with higher income; this pattern was also found in households with higher levels of general education.
- Formal nutrition education is associated with higher scores for nutrition knowledge, cooking confidence and attitude to food and nutrition. Whilst these scores have been shown to correlate positively with healthier patterns of food consumption (see sections 6.4.2 and 6.4.3), formal nutrition education has not been associated with similar patterns.
- Support within the home, in the form or paid and unpaid help, has been associated with food consumption but there are no straightforward explanations for the patterns which are observed; it is suspected that they may be related to income.

Chapter 7 - Discussion

7.1 Overview and Discussion of Main Results

The results of the quantitative analysis are presented in chapter five and six; in this section, the main findings are discussed. To help this discussion, qualitative analysis of the questionnaire comments will be used to illustrate and develop the initial interpretation of the results, given at the end of each section in chapter six. In addition, reference will be made to the literature. Limitations of the methodology and conceptual framework will be highlighted and discussed further in sections 7.2 and 7.3 respectively.

7.1.1 Food Shopping

Food shopping has been described in terms of time and division of responsibility. No association was found between the amount of time spent in food shopping and any of the work variables; no association either with the characteristics of the main food provider. One possible explanation for this is that the household members find ways of managing food shopping that take into account the time and timing constraints resulting from work. Methodological considerations relating to the measurement of food shopping data are discussed further in 7.2.

The division of responsibility for food shopping becomes more equally shared between the adults in the household, when the main food provider works longer hours and where Adult two works fewer hours; shared responsibility is also found when the main food provider has lower job satisfaction and Adult two higher job satisfaction scores. This supports the association between work and job satisfaction - see section 5.2.6. However, if this is interpreted using job satisfaction as an indicator of work related stress, the results suggest that when the main food provider experiences higher levels of stress responsibility is shared more equally; for adult two a decrease in stress has the same result.

7.1.1.1 Finding ways to manage food shopping

Whilst no association has been found between the work variables and the time spent in food shopping this does not mean that a relationship does not exist. Rather than working hours (*time*) directly influencing the time spent in food shopping, shopping behaviour may change. The qualitative analysis shows some of the strategies that are used; possibly to alleviate time

constraints resulting from patterns of work. However, before discussion of shopping patterns it is important to consider the access to shops in terms of time.

With the introduction of longer opening hours in supermarkets and greater opportunities to shop, there is more time available to do the food shopping; thus, increased work commitments may have less of an impact. As one respondent stated;

- *"...Greater opening hours of the shops has been a great boon." (281)*

Aside from the increased opportunities to shop, food shopping is done taking into account work patterns. For example, doing food shopping after work or during work breaks;

- *"Most food shopping is done one evening in the week. The rest is usually done by Adult one during work lunch break." (591)*

In such cases food shopping patterns are fragmented to fit around work commitments. These patterns of food shopping may be supported by using conveniently located stores:

- *"Many and varied outlets used ie supermarkets, city centre markets, small independent outlets..." (37)*

The choice of shop is also related to the type of food shopping being done, for example main or top up food shopping:

- *"I try to shop locally whenever possible and use supermarkets for cartons of OJ, toothbrushes etc and my local fruit and veg shop mostly and my local corner store..." (473)*
- *"I shop on Mon for main food and most other days weather permitting for bread, crisps and any other items needed." (321)*

This also suggests that bulk buying and planning food shopping in advance are effective strategies. Bulk buying basic food items and supplementing with fresh items, purchased more frequently, may save time or may just fit better with patterns of work:

- *"I buy wholefoods in bulk once every 3 months." (315)*
- *"I bulk buy and freeze bread and meat. I bulk buy and freeze orange juice." (567)*

Home delivery is also used in some households:

- *"I have my main shopping delivered once a week by Iceland" (188)*

However, this may not necessarily save time; online time, choosing food shopping on the internet, may be as time consuming as visiting the store in person. It is, nevertheless, a change in food shopping patterns.

It appears that food shopping has shown no quantitative association with work because strategies are in place to overcome the problems of demands on time and timing; thus an indirect association exists where work leads to an individual changing their shopping behaviour to alleviate time constraints. These assumptions are based on the qualitative results and require further research to be supported by quantitative analysis.

7.1.1.2 Sharing the responsibility for food shopping

Sharing the responsibility for food shopping more equally occurs when the main food provider spends more time, or adult two less time, at work. This suggests a balance between work and division of food related activities, based on the level of involvement in work by each of the adults in the house. However, coinciding work schedules may also have a role to play:

- *"If both parents are around it is shared equally." (534)*

In this case shared responsibility is about the timing of work rather than work time; being in the same place at the same time is more important than the time available.

Work time and timing may be less important if the main food provider cannot detach themselves from the process even when not physically doing the shopping; the main food provider may take most of the responsibility for food shopping because it is easier than making lists and telling their partner what to buy:

- *"I always take responsibility for food prep and shopping. If partner helps the list is given or told what to cook for kids etc." (578)*

Additionally, the division of responsibility may be entirely independent of work;

- *"It is easier for the main food provider to shop during the week when the kids are at school..." (435)*

It may be quicker and easier for the main food provider to do the food shopping alone; avoiding pestering from children. Shopping at these times may also be quieter and long queues at the checkout may also be avoided; this may also influence the amount of time in food shopping.

In summary, it appears that time committed to work and the timing of work may have some influence on who does the food shopping. However, strategies are also in place to allow the food shopping to be done with the minimum fuss and effort, thus the choice of who does the food shopping may be entirely independent of work time or timing.

7.1.2 Food Preparation

Food preparation has also been described in terms of time and division of responsibility. No association was found between the time spent in food preparation, during the week or at the weekend, and any of the work variables. This is contrary to the food provision data presented in chapter five which showed that significantly less time was spent in food preparation during the week compared to the weekend. Most respondents stated that they worked at weekends thus, it was assumed that more hours are worked during the week compared to the weekend. Therefore, the qualitative data has been examined to identify possible explanations for the differences in food preparation time; convenience, meal type and family schedules are just some of the factors.

The division of responsibility for food preparation is shared more equally when working hours increase for the main food provider and decrease for Adult two. The quantitative analysis did not identify shift work or flexibility as significant determinants but qualitative analysis reveals timing of work, in particular shift work as influential. This suggests that both the time available and the availability of family members (due to work timing) are both important in determining who does the food preparation.

7.1.2.1 Finding the time for food preparation

Although the quantitative analysis shows no association with working hours but it appears that time is still an important factor, especially with reference to quick and easy food preparation:

- *"We are that busy that we prepare quick meals.. Beans on Toast /Soup/Bacon and Eggs etc." (114)*
- *"Nearly always convenience food - no time for anything else." (209)*

These comments suggest lack of time and busy lifestyle are affecting food behaviour, in particular the type of food being consumed; although there is no direct association with work.

The longer time spent in food preparation at the weekend may reflect the types of food which are eaten at the weekend - time saving may be achieved by preparing quick and easy meals during the week and more elaborate family meals at the weekend:

- *"During the working week tend to utilise pre-prepared / fairly quick to cook foods or prepare the day before for the next day, more time available at the weekend." (281)*

Apart from work commitments there are several reasons why time and meal type vary between weekdays and weekend, independent of work:

- *"Meals vary throughout the week dependent on activities in the evenings." (47)*
- *"Note, I arrive home at 16.45 - the children have activities every evening but one, ie football, swimming etc, usually commencing at 18.00 not much time for meals..." (222)*

Involvement in leisure activities and after school clubs may influence, not only the time spent in food preparation, but also the types of foods prepared and eaten. Differences in the type of food prepared during the week and at the weekend variations in time :

- *"During the working week tend to utilise pre-prepared / fairly quick to cook foods or prepare the day before for the next day, more time available at the weekend." (281)*
- *"We do tend to purchase convenience food for during the week with 'proper' food at the weekends." (581)*

Discrimination between the types of foods chosen during the week and at the weekend - convenience versus more traditional foods - will be discussed further in section 7.1.3.

Finally, preparation and planning are essential strategies involved in time saving:

- *"With ours being a one parent working family I find I have to prepare 2 or 3 meals and freeze some to save time at a later date." (173)*
- *"On my day off I sometimes batch cook my own convenience meals and freeze them to save time with food preparation if I'm very busy." (433)*

- *"...when cooking I always try to prepare double / treble quantities to repeat midweek ie cheese sauce, pasta sauce, stew etc, but will often keep meals simple ie steamed veg+pasta+parmesan cheese, jacket pot+pasta sauce." (473)*

This suggests a subconscious understanding of how work impacts on food behaviour, which is dealt with by adopting a time and labour saving approach to food provision in the home. It is unclear whether the knowledge, attitudes and skills of the main food provider are involved; for example, a positive attitude towards food and nutrition may facilitate preparation and planning so home cooked convenience meals are available if time is short; conversely, a more negative attitude may result in less planning and preparation and more ready made convenience foods being consumed.

7.1.2.2 Food preparation - being "in the right place at the right time"

Working hours were associated with food preparation being shared more equally in households where the main food provider worked longer hours; in households where Adult 2 worked longer hours the main food provider takes greater responsibility for food preparation:

- *"Because of the long hours my husband spends at work the majority of the above is done by myself (with a little help from the children)." (208)*

These findings support the hypothesis that increased work time leads to a more equal distribution of food responsibility within the household; but it is still unclear whether the association is based on lack of available time or the fact that longer hours mean that the adults are more likely to be outside the home when food preparation occurs. If this is the case then strategies will have to be in place to cope with these differing schedules; some of the strategies discussed in section 7.1.2.1 may be important in finding ways to cope with these schedules.

The qualitative analysis indicates that the association is based on more than time alone; the availability of adults at critical periods, such as when the children come home from school, is also important in predicting their involvement and division of labour:

- *"Because of the hours my partner works at present it is difficult at times to have meals together as a family so preparation becomes difficult." (210)*
- *"Adult 1 prepares food for self and child weekdays and for family at weekends. Adult 2 has convenience meals in the week." (642)*

The timing of work can determine who does the food preparation; although association is not shown in the quantitative analysis of shift work and flexibility:

- *"Both adults whenever possible share the workload of shopping, preparation of food, eating together as a family (except when adult 2 is on evening shift)." (399)*
- *"Because of the shift patterns we work shopping and preparing and cooking meals depends on who's around..." (517)*

In summary it seems that whilst the time available is associated with food preparation, the responsibility for preparing the family meal is also dependant on availability and schedules of family members - who is around at the right time. This "*provisional response to intransigent problems of scheduling everyday life*" (Warde, 1999:518) means that *timing* may be a more pertinent indicator of involvement in food provisioning activities, than *lack of time*. This view is supported by the research findings.

7.1.3 Patterns of Food Consumption

Food consumption was considered in terms of food groups, food component scores and convenience food. The balance of the diet was assessed using the healthy eating score for each household, calculated using the 1994 COMA recommendations. General patterns of food consumption were observed by looking at variation in food group consumption and food component scores. The results showed no association between the work variables and the consumption of any of the above food consumption measures. There are a number of possible reasons for this; methodological considerations relating to the validity of food consumption data; time and timing as determinants of food consumption are not accurately represented by work hours and patterns of work; finally, social factors.

7.1.3.1 Food consumption - time and timing

The discussion in sections 7.1.1 and 7.1.2 suggests that food consumption changes depending on the amount of time available; quicker more convenient food is used during the week when less time is available for food preparation and more traditional or elaborate meals are prepared at the weekend;

- *"As a part time working Mum it is important that we eat together so I plan that on busy workdays I prepare casseroles of dinners that have been prepared the day before and fresh veg that don't take long to cook" (23)*
- *"My husband is a more creative cook but doesn't get time during the week. I tend to do the traditional foods." (227)*
- *"I still maintain a 'proper' Sunday lunch as I find this is the only time we can have quality time together as a family and also enjoy a good meal without having to rush." (366)*

These comments illustrate that food has social and intrinsic value that can determine its usage irrespective of time constraints. For example, certain foods are chosen because of their significance in pulling the family together at meal times:

- *"We always have a big Sunday Roast together." (226)*

Other foods have intrinsic value due to their convenience and low level of involvement in the provision of a meal; not necessarily related to lack of time:

- *"Mainly use fast food or frozen." (510)*
- *"We often buy fresh ready made meals." (570)*

However, some respondents were pointed out that they never used convenience foods; indicating that the value placed on such products determines their use rather than time:

- *"We never eat pre made food, I always make the pies etc at home." (122)*
- *"...I rarely us convenience foods - all home baking and cooking." (167)*

The quantitative results in 6.2.2 and 6.2.3 show that no strong association was found between time or timing and patterns of food consumption. Whilst the qualitative analysis suggests a link with certain aspects of time and timing there is no evidence to support the causality of work of this association. In addition, only general patterns of food consumption may be affected; the balance of the diet and relative healthiness of the foods consumed may be determined by additional factors.

7.1.3.2 Healthy Eating

Lappalainen *et al* (1998) have identified lack of time (*time*), irregular working hours (*timing*) and busy lifestyle as the main barriers to adopting a healthier diet. However, the relative healthiness of the foods consumed, represented by the healthy eating and food component scores, were not associated with working hours (*time*), shift work (*timing*) or flexibility (*timing*) - see sections 6.2.2 and 6.2.3. These findings are supported by qualitative results:

- *"Time is not a problem if you make nutritious food preparation a priority." (457)*
- *"I take care and pride in shopping for the best (ie healthiest and tastiest) food within our budget. I enjoy cooking it and eating it." (496)*

This suggests that the value placed on nutritious food is an important consideration in choosing a healthier diet; also, enjoyment of cooking and choosing food seems to be associated with healthy food consumption:

- *"I enjoy cooking and see food as our family's health insurance!..." (221)*

Healthy food consumption, like more the general patterns discussed in section 7.1.3.1, are also linked with organisation and planning:

- *"We organise food carefully. Each two week period has a menu prepared so we can cover all the main food groups... We have found this to provide good food every day, gets rid of guesswork and also costs us less than ad hoc shopping and cooking would." (15)*

In this case, awareness of the main food groups helps in choosing the foods to be consumed and may be important in achieving a more balanced diet.

Another consideration is individual food preferences, which may be a barrier to healthier food consumption, perhaps more than time and timing:

- *"I know what is healthy and adults in our family eat healthily but children will not so end up having pizza's etc. Not limited by lack of time, can't get them to like healthy foods. If the person compiling this research is not a parent they will not appreciate this fact of modern life." (231)*

Food likes and dislikes will be discussed further in section 7.1.3.3.

In summary, the results suggest that time constraints resulting from work do not appear to be an insurmountable barrier to healthy eating. This challenges the findings of Lappalainen *et al* (1998) who identified time related factors as the main barriers to adopting a healthier diet. The value placed on a healthy diet and enjoyment in food preparation appear to be significant determinants. However, it must be noted that those who responded to the questionnaire are more likely to be interested in issues surrounding food and nutrition in the first place.

7.1.3.3 Food preferences - likes and dislikes

The food consumption data has been measured without taking into account the individual likes and dislikes of family members; methodological limitations of this approach are discussed in section 7.2. Whilst only general patterns of food consumption were of interest the qualitative analysis suggests that food preferences determine not only food consumption but also food preparation and eating patterns:

- *"Our food is geared to what the children will eat as I won't cook twice ,<YAWN!> so diet pretty boring with white bread, some meals no veg." (108)*
- *"As I have a daughter of 9 who will not eat cooked meals and is very, VERY fussy with her food I am sometimes at a loss as to what to cook." (271)*
- *"If I do casseroles the children are less keen than if they have junk food - fish fingers, nuggets, pizza." (330)*
- *"Between 2 adults and 2 children we sometimes prepare 3 different meals ie we don't all like the same things." (638)*

In situations such as these, considerably more time may be spent in food preparation if several meals are prepared to cater for individual food preferences. This may contribute to time constraints and stress more so than work commitments; a dimension for future study.

Food preferences, which exclude particular food groups, will significantly alter the balance of the diet between family members; the balance of the diet for a vegetarian will be significantly different to that of a meat eater. This may increase food preparation, time and stress:

- *"I am a strict veggie; neither my husband or my children are. We rarely purchase any 'red meats' however and often eat meat/fish free meals. We do tend to eat different meals (ie with everyone eating something slightly different) often as a consequence." (131)*
- *"It is virtually impossible to cook just one meal for the family due to children's different likes and dislikes. Half the family prefer largely vegetarian diet - two are rampant carnivores! We usually have to provide an alternative to the main menu, it is like running a restaurant and it is a pain!" (325)*

However, in some cases this is managed by choosing foods that minimise additional food preparation, by eating foods that can be more easily adapted to cater for differing tastes:

- *"Cook for meat-eaters and veggies. Sometimes this means preparing 2 types of Bolognaise (for example). Try to have adaptable meals eg. baked potatoes and....." (116)*

In summary, food preferences will alter patterns of general food consumption and the balance of the diet; in addition they may be a source of increased involvement and time in food preparation and cooking, which may in turn increase time constraints and stress. Further research is needed to determine the ways in which diversity of family food preferences is dealt with

7.1.4 Characteristics of the main food provider

Nutrition knowledge, attitudes and cooking skills were the characteristics of the main food provider that were considered in terms of their influence on food behaviour. No association was found with food provision but higher nutrition knowledge and attitude scores were associated with healthier patterns of food consumption; these variables were also associated with more meals eaten together as a family. Confidence in cooking skills were also associated with food consumption. The previous sections have highlighted some of the possible mechanisms by which knowledge, attitude and skills may influence food behaviour; these will be discussed further here.

7.1.4.1 Nutrition knowledge - putting theory into practice

The nutrition knowledge of the main food provider was assessed using a set of 25 questions relating to different aspects of healthy eating; fat, energy, fruit and vegetables, fibre and sodium. Methodological considerations relating to these questions and the measurement of nutrition knowledge are given in section 7.2. The qualitative analysis shows that certain aspects of nutrition knowledge, particularly fruit and vegetable consumption, are important:

- *"We try to buy low fat' low salt and try to include fresh veg. Tend to live on casseroles!" (187)*
- *"Usually we cook evening meal using fresh ingredients. We vary menu a lot to include meat, fish and vegetarian dishes." (395)*
- *"Try to use fresh ingredients - plenty of fruit and veg." (425)*

However, even though higher levels of nutrition knowledge were associated with healthy food consumption, knowing how to choose and prepare healthy food does not always lead to nutritious food being consumed:

- *"There is a difference between what is known in theory and what is done in practice due to different family activities and work commitments" (422)*

7.1.4.2 Cooking Skills

The empirical data show no association between cooking skills and food preparation within the household. The cooking skills of the main food provider were considered with time and division of labour for food shopping and preparation; no association was found. Cooking skills were found to correlate positively with consumption of fruit, vegetables and whole foods and to correlate negatively with convenience foods, chips and baked beans. However, the qualitative analysis highlights some additional points. For example,

Batch cooking - some respondents stated that they prepare large batches of food to keep for use during the week;

- *"On my day off I sometimes batch cook my own convenience meals and freeze them to save time with food preparation if I'm very busy." (433)*
- *In such cases the possession of cooking skills may help in the preparation of food that can be used when time constraints are experienced, due to increased work commitments.*

Enjoy cooking - some enjoy the process of cooking and providing food for the family;

- *"...We use very little convenience food believing in and enjoying preparing proper food for the family..." (15)*

It may be that greater confidence in cooking skills enhance enjoyment of the food preparation process - further research is needed to determine whether enjoyment is associated with particular patterns of food consumption.

Creative versus traditional cooking - the type of food being prepared or the meal occasion may be determined by the level of cooking skills;

- *"My husband is a more creative cook but doesn't get time during the week. I tend to do the traditional foods." (227)*

In this case issues of time use are important in the division of food preparation within the household (see section 7.1.2); creative cooking skills are associated with more elaborate meals which require more time being spent in food preparation; traditional cooking skills are associated with routine meals during the week.

7.1.4.3 Attitudes to food and nutrition

Attitudes constitute another factor that may play an important role in modifying behaviour. The results from this research have found an association between attitudes to food and nutrition and healthier food consumption. Attitudes have been linked with personal values, which in turn have been associated with food choice and food related behaviour (Granzin & Bahn, 1982). The value placed on food provision, food preparation and healthy food choices could be an important factor in determining food behaviour (also see discussion in 7.1.3). It may be that work and resultant time constraints do not affect food behaviour if the main food provider values the importance of making healthy food choices and providing food for the family:

- *"...We use very little convenience food believing in and enjoying preparing proper food for the family..." (15)*
- *"I (Mum) do it all. The feeding of my family gives me great pleasure. We have a meat and veg meal every night apart from pasta and rice dishes." (270)*

In such cases it may be that the main food provider prioritises the time they have available to them to provide food for the family through sacrificing time which may be spent in personal leisure activities or relaxation.

In addition, a positive health orientated attitude towards food and nutrition may provide increased opportunities for children to gain practical knowledge and cooking skills. Conversely, a negative attitude may be associated with less food provision within the home, less variety in food consumption and decreased opportunities to learn about food:

- *"Absolutely hate cooking, would have take away meals everynight if it wasn't for the cost." (398)*
- *"I hate shopping for food of any kind - I find it so boring and we always end up with the same as last week because of the money we've got available for food." (421)*
- *"I wish we only ate once a week, it would save a lot of work." (490)*

As the mother has been identified as one of the most significant sources of cooking skills and food and nutrition education - see Table 5.37 - a positive health orientated attitude may be an important indicator of the opportunities available within the home to gain food related skills and positive messages about healthy eating.

7.1.5 Eating Patterns

The eating patterns were measured on the frequency of eating the main family meal together; significant associations were found with working hours; longer working hours leading to fewer meals being eaten together as a family during the week, although there was no association with eating patterns at the weekend (see section 6.2.4). Whilst this associates eating patterns with the amount of time available, shift work and flexibility were not found to be significant factors, suggesting that the timing of work is not important. However, qualitative analysis reveals issues of timing as important, particularly shift work. The social significance of family meal times is also an important determinant of eating patterns; both in terms of who eats with who and the types of food consumed.

7.1.5.1 Family scheduling

The difficulties with getting family members in the right place at the right time have been detailed in earlier sections; the problems associated with different family schedules can impact on food preparation, the types of food consumed and eating patterns. Although there is no association with the timing of work and eating patterns in the quantitative analysis, it appears that patterns of work can have an influence:

- *"Our family life (inc. meals) are totally governed by the shift work..." (23)*
- *"Through the week I prepare food for the children and my husband prepares the food we eat when the children are in bed." (404)*
- *"...shift work dictates who eats with who." (435)*

Once again time related issues and family scheduling are identified as significant factors; but it is not only work that influences these factors leisure activities will have an impact too:

- *"Meal times during the week have to be split on certain days due to children's after school activities so on some evenings one child may eat on their own while the others eat with the adults." (289)*

As the children within the house get older, it seems that meal times become more fragmented, possibly due to increased participation in leisure activities and busy social lives:

- *"I always cook at teatime. I have 6 children, the older two are 18 and 16, they are not usually in the house at teatime. They reheat their meal when they come in." (71)*

For some households, possibly those with younger children, there may be a stronger emphasis on maintaining family meal times:

- *"We always eat together.... Always eat round a table NEVER in front of the TV..." (108)*
- *"We always eat together when we are at home..." (269)*

However, meal times are not only about food consumption but are opportunities to spend time together as a family; perhaps a focal point within the day.

7.1.5.2 Social importance of food within the family

Food is not only dictated by work commitments and family schedules; the social significance of food and socialisation of family meal times may be important influences on eating patterns and also the types of food consumed. The discussion in earlier sections has highlighted some of the differences in food behaviour during the week and at the weekend; there seems to be a value placed on meal times at weekends:

- *"Sunday evening always have a roast with hot pud." (108)*
- *"We always have a big Sunday Roast together." (226)*

These comments also indicate that weekends are times when more traditional patterns of food consumption are followed; possibly involving greater involvement in food preparation and cooking. It is unclear though, whether this is due to reduced work commitments at the weekend or a desire to maintain traditional patterns of eating or simply a focal point for having all family members together.

- *"Being a very 'sociable' family we never have a 'set meal day'. We frequently entertain adults, children and whole families so our food is very mixed. We are a 'foody' family - for pleasure, recreation and fun." (212)*

Food can be seen as a means of bringing the family together and developing social interaction; food behaviour thus becomes a means of facilitating this process and can provide numerous learning opportunities for children to gain skills and knowledge.

- *"...I love introducing international flavours and dishes to our children." (221)*
- *"I (Mum) do it all. The feeding of my family gives me great pleasure." (270)*

The stimulus for food to be seen in this way may come from a positive attitude, higher levels of nutrition knowledge and cooking skills; more research is needed to explore these issues.

7.1.6 Characteristics of the Home Environment

The home environment was considered in terms of the total household income and the level of support within the home from paid and unpaid sources. Income was positively associated with total working hours within the household and working hours positively associated with help within the home. It is unclear whether paid help in the home is associated with income.

7.1.6.1 Income

Income was found to be associated with patterns of food consumption (see section 6.5); higher incomes were associated with healthier patterns of food consumption. It also appears from the qualitative analysis that general patterns of food consumption may be related to income, with possibly influences on the levels of involvement in food preparation:

- *"The type of food bought is dependent on time and money ie when working full time more expensive convenience food bought and eat out more. When part time therefore less money conventional food bought requiring longer preparation." (445)*

In this case working hours are impacting on food behaviour, not directly though time use, but via income which in turn affects the amount of time in food preparation and the type of food consumed. This perspective has not been considered in the quantitative analysis and further analysis would be required to investigate these links.

7.1.6.2 External sources of help in the home

The main source of help within the home was from unpaid sources, most commonly grandparents, other family members and friends. The qualitative analysis showed that help from these sources also contributed to the food provision activities:

- *"Nanan always buys and cooks our food, it is of good variety and include fresh veg, spuds, salads etc at least four times a week." (42)*
- *"My mother often comes to look after the children and cooks a meal. Once or twice a week." (121)*
- *"Grandparents prepare 1 family meal per week for when we get home from work." (127)*

The quantitative analysis in section 6.5.8 show that the working hours of the main food provider are associated with help within the home; so in households where the main food provider works longer hours the provision of meals by external sources of help may alleviate time constraints.

Paid help in the home mainly came from cleaners and childminders. Due to the work commitments of the adults children sometimes ate with the childminder during the week:

- *"Childminder gives child light tea after school." (205)*
- *"...Three evenings a week the children eat with the childminder. Two evenings every fortnight the children eat at their Father's. I worries me that I do not know what they will eat on these days." (269)*

The latter comment suggests that there is a degree of worry when the main food provider cannot control the types of foods being consumed by their children. Concern about the children's health and well-being may be another reason why food behaviour is prioritised within the home despite time constraints and work commitments.

7.1.6.3 Getting the children involved

In addition to external sources of help, the qualitative analysis revealed the importance of children's involvement in the management of food related activities within the home:

- *"Daughter who is 14 cooks, hoovers, etc." (118)*
- *"Being a single parent I encourage both of my children to help prepare it with me." (183)*
- *"We have rota for kitchen duties ie cooking, laying, washing, clearing the table so that everyone does their fair share and learns how to look after themselves." (626)*

This may be an important source of gaining knowledge and skills within the home. The analysis in section 5.4 shows that the mother is an important source of cooking skills and knowledge within the home (see Table 5.37). Therefore, encouraging children's involvement within food preparation and cooking is an important way for these skills to be passed on. Working patterns impact on this process if the mother (main food provider) has less time to spend with the children and encourage them due to work commitments; conversely, it may result in the children having to become more involved if the main food provider is not around:

- *"Children have to fend for themselves majority of the time." (307)*

7.2 Discussion of Methodology and Limitations

The development of a suitable methodology has been reviewed in chapter four. At the time, it was felt that the most appropriate methods were chosen, to meet the research aims and objectives and take into account the resources available. At the end of the research process, once the data collection and analysis has been completed, there are always elements of the research that could be improved; hindsight offers a new perspective on the efficacy of the methodology. Therefore, the purpose of this section is to review these methodological limitations and identify ways in which the research design and implementation could be improved.

7.2.1 The Research Design

A survey design was chosen for the reasons detailed in chapter four. The approach is still considered appropriate as it focuses on variation within a sample, but the method of data collection could be enhanced. The research used questionnaires to collect data on the research variables; whilst this is useful for gathering large quantities of data some of the detail may have been lost. The qualitative analysis, which was a secondary consideration in the research design, was not structured but did yield an additional perspective on the research problem. Some of the issues highlighted as important by the qualitative analysis had not been included in the design of the questionnaire and so no quantitative data had been collected. However, now these areas have been identified as important they merit further research; some of the methods that may be useful in future research are detailed below.

7.2.1.1 Case studies using activity diaries

The time data that was collected on the questionnaire only yielded information about blocks of time spent in work or food related activities. Using activity diaries would enable information to be collected not only on the amount of time spent in each activity but also on the segmentation and sequencing of that time. The timing of different activities has been identified as being just as important, if not more so, than the actual amount of time; this detail was lost using questionnaires. It is proposed that a case study approach, perhaps using 20 households, would allow this kind of information to be collected. Diaries should be used for a minimum of three days, two work days and one weekend day; all family members should involved in the data

collection to enable time, timing and integration of differing family schedules to be examined. Although this method would be very time and labour intensive and require high levels of motivation from the participants, the richness of the data would certainly be enhanced.

7.2.1.2 Interviewing the main food provider

One of the main points to arise from the qualitative analysis was the importance of developing coping strategies. The diverse approaches, which were used to juggle work and food provision, have only been hinted at and deserve further investigation. It is felt that semi-structured interviews with the main food provider would elicit more detailed information about the day to day management of household activities. Additionally, issues such as attitudes towards food and time and the value placed on healthy eating and family meals can be explored.

7.2.1.3 Family focus groups

The rationale behind this would be to give all members of the family an opportunity to contribute to the discussion. This may raise issues that have not been considered within the scope of this research but which are nonetheless important in the association between work and food behaviour. For example, the perspective of the main food provider may be very different to that of the other adult (where applicable) and children. This research has focused on the knowledge and attitudes of the main food provider but these may be overridden by those of other family members; as one respondent stated *"I know what is healthy and adults in our family eat healthily but children will not so end up having pizza's etc..... can't get them to like healthy foods." (231)*

7.2.1.4 Modified research design

"The purpose of interviewing is to find out what is in and on someone else's mind. We interview people to find out from them those things which we cannot directly observe." (Patton 1990, cited by Hughes in Greenfield 2002:209).

Taking the factors discussed in this section into consideration, a modified research design would follow the survey format but include additional means of collecting both quantitative and qualitative data. The interviews and focus groups can generate information about the mechanisms by which work and food activities are integrated into everyday life; thus, themes may identified that can be used to develop questionnaires for a larger survey.

7.2.2 Issues of Reliability and Validity

Reliability and validity are about ensuring the reproducibility and appropriateness of the data. Both were considered in the development of the research methodology and in the design of the questionnaire. However, having completed the data collection and analysis the results suggest ways in which both reliability and validity could be improved.

Although reliability is primarily concerned with the reproducibility of results it is also important to consider whether the respondent is actually able to answer the questions; *"It is wise to avoid questions about which people are unlikely to have an opinion or knowledge, or at least to provide 'do not know' or 'cannot decide' responses."* (de Vaus 1996:54). This is an important point and one that is particularly relevant to the statements used to assess nutrition knowledge. The results relating to the percentage of correct answers for these nutrition statements can be found in section 5.4. The correct response rates (which are discussed in greater detail below) suggest that respondents had great difficulty in defining some of these statements as *'True'* or *'False'*. As no option was given to answer *'do not know'* it is possible that if respondents did not know the answer, rather than trying to work it out, became increasingly frustrated and impatiently chose the wrong answer. In this case the question is unreliable as it does not measure the respondent's true level of nutrition knowledge; there is no differentiation between those who chose the wrong answer due to lack of knowledge or due to incorrect knowledge. This will be discussed further in section 7.2.2.3.

Validity is concerned with the variables used for data collection, and whether the variable is *"one which measures what it is intended to measure"* (de Vaus 1996:56). Validity is closely linked with the conceptual framework and to the definition of research concepts; it looks at whether the dimension used to describe a concept are suitable and whether the variables used to describe each dimension are good measures. For example, in this research the concept of work was defined by dimensions of time and timing, which in turn were measured by the number of hours worked each week (time), shift work (timing) and flexibility (timing). However, following the analysis of the quantitative and qualitative data, several issues of validity have arisen; these will be discussed further in section 7.2.2.1. It is important to remember though that *"there is no ideal way of determining the validity of a measure"* (de Vaus 1996:57) and that the measures used in this research were based on the conceptual framework developed in chapter two.

7.2.2.1 Measures of work

Work has been considered in terms of its impact on time use within the home and working hours, shift work and flexi-time have been used to define work. They have been interpreted as constructs of time use, in terms of time and timing, but in fact may have other meanings that have not been considered in this research. There is also some doubt whether working hours, shift work and flexibility are valid indicators of time use; it is also unclear whether using these variables alone, without consideration of other household activities, is a valid measure of time use. What has become evident from examining the quantitative and qualitative together is that strategies are developed to cope with the demands of work commitments and time constraints; these coping strategies may mask any association between work and food behaviour if other measures of time use are not considered.

7.2.2 2 Measures of food behaviour

The measures of food provision (shopping and preparation) cannot give a true representation of their association with work if there is no consideration of coping strategies; time and division of responsibility need to be examined in terms fragmentation and spacing to determine how adaptations are made in response to work commitments. The time for food shopping only takes into account the total time for all shopping and does not consider the way in which shopping trips are broken up during the week. For example, if time constraints are experienced because of increased work commitments, shorter more frequent shopping trips may be done, rather than one main shop. This pattern is suggested by the results in section 5.3 but this data has not been incorporated into the measures of food shopping used for further analysis in chapter six. Therefore, the validity of the measures of food shopping and food behaviour could be improved by considering patterns of behaviour in addition to time and division of responsibility; activity diary data would allow this to be examined.

The food consumption data was measured using a food frequency questionnaire that had been developed for the purpose of this research and that assessed household food consumption rather than individual food intake. It was necessary to do this as the COMA recommendations (1994) were used to make comparisons with household food consumption and develop the healthy eating score. Household inventory methods and food diaries could have been used to validate the food frequency questionnaire but due to time and budget constraints these methods were rejected. This would have improved the validity of the food frequency questionnaire and would be recommended for future research.

The reliability of the questionnaires could also be improved with additional consideration of food portion sizes. As discussed in section 5.4.1 the portion sizes were assumed appropriate and constant for each food item. This allowed consumption within each food group to be considered in terms of its proportion of the diet based on the frequency of consumption alone. However, according to Kemm and Booth (1992:160) if variation in portion size is considered, information on *"how much"* food is consumed can also be obtained. Thus more reliable comparisons with the COMA (1994) recommendations could have been made using estimates of portion size.

One of the most widely used methods for assessing portion size on food frequency questionnaires is to include some visual representation of the food items being measured. Photos of small, medium and large portion sizes for particular food items are included with the questionnaire and respondents are asked to indicate both portion size and frequency of consumption. Validated questionnaires, which use this format, have been produced by the Institute of Food Research and include colour photos of medium sized portions of the food items on the questionnaire. Respondents indicate whether their portion size was the same, smaller or larger than the ones pictured and thus some indication of the amount of food consumed can be obtained. Validated questionnaires such as this were not used in this research because of the cost involved in distributing these to such a large sample.

Information on portion sizes could also modify the healthy eating score. A common understanding of average portion sizes, indicative of the COMA (1994) recommendations, would allow the score to be calculated based on amounts of food rather than intake frequency. This may also give a more reliable and valid measure of whether the respondents were exceeding or failing to meet these recommendations.

It must also be emphasised that taking measures of the household food intake, as opposed to individual food intake, imposes limitations on the interpretation of the data. Only very general comparisons can be made with the COMA recommendations and individual food preferences must be ignored. The qualitative analysis also suggests that food preferences within the household are significant determinants of food consumption. The discussion in section 7.1.3.3 highlights the need to consider food preference not only in terms of variation in food consumption but also in terms of its contribution to food preparation.

The different meals that are consumed by members of the household must also be considered when comparisons are made with dietary recommendations. It must be remembered that some individuals may be meeting the targets and while others having a less balanced diet - see

discussion in section 7.1.3.2 and 7.1.3.3. This has implications for the healthy eating score, which was developed by making comparisons with the COMA (1994) recommendations - see section 5.4.4 - and used household consumption for each of the food groups. In vegetarian households the validity of this method is flawed as consumption of the meat and fish group would be zero. In such cases the pragmatic limits used for calculation of the score (see Table 5.33 and Appendix I) would have to be revised.

Despite these limitations the food consumption data did provide an overview of the study population's diet. When the data was interpreted as frequency of intake, rather than number of portions (see 5.4.1), and principal components analysis was applied the food components identified groups within the food consumption data that described some of the variation. The food items which correlated mostly strongly with each component were logical, for example fruit and vegetables grouped with wholemeal bread, pulses, salad and biscuits grouped with sweets, crisps and cake. If fruit and vegetables had grouped with sweets, crisps and cake then the accuracy of the data would have been examined with caution.

7.2.2.3 Measuring characteristics of the main food provider

It is unclear whether the design of the questions for the measurement of nutrition knowledge, attitudes and cooking are reliable measures of these variables. On reflection it is thought that the wording of some of the questions may be misleading or confusing; thus the questions do not assess what they were designed to assess. These questions were designed following advice given by Kemm and Booth (1992) on the assessment of knowledge and attitudes; however, further testing of these measures is required to confirm their accuracy.

The reliability of the measures of nutrition knowledge is of particular concern; highlighted in section 7.2.2. For example, one statement only had a correct response rate of 16.5%. It is unclear whether the high number of incorrect responses is due to a poor standard of nutrition knowledge, leading to the wrong answer being chosen or because they really do not know the answer and have no frame of reference by which to work it out. Not having a *'do not know'* option available may lead the respondent to become increasingly frustrated if they do not know the answer; an indicator of the poor reliability. In this case they are likely to guess the answer and not use their existing knowledge to work it out; but if this were the case one would expect a 50% correct response rate by chance alone. This is not the case and therefore suggests that respondents have chosen the wrong answer, which is more a reflection of their level of nutrition knowledge.

7.2.2.4 Measuring characteristics of the home environment

The measurement of household income could be improved by asking respondents to give specific details of their income rather than ticking one of four categories; this would enhance the quality of the data although this information is sensitive and a question in this format may lead to more missing data, if respondents choose not to answer it. To improve the data relating to support within the home additional information needs to be collected about when the help is received; this information could also be collected using activity diaries.

7.2.3 Research Bias

In any research the researcher introduces an element of bias. This can be minimised by ensuring reliability and validity throughout the design, implementation and analysis of the research; however, the interpretation of the data will introduce some subjectivity:

"I know what is healthy and adults in our family eat healthily but children will not so end up having pizza's etc. Not limited by lack of time, can't get them to like healthy foods. If the person compiling this research is not a parent they will not appreciate this fact of modern life." (231)

In any research which asks people about the food they eat particular consideration must be given to the bias introduced by the sample (Willett, 1990); the very fact that respondents have taken the time and effort to complete the questionnaire implies that they are already interested in the subject. Therefore those who have participated in the study are more likely to be interested in food; have higher levels of nutrition knowledge; have a more positive attitude towards food activities. This should be borne in mind when considering the results.

7.3 Discussion of the Conceptual Framework and Limitations

The conceptual framework for this research is based on the assumption that more time spent in work activities leads to less time available for other activities; essentially, a time use equation is established which assumes that more time committed to work equal less time for essential activities, including those related to food. In chapter two increased working hours and female employment were discussed in terms of their contribution to time famine. The model presented in Figure 2.1 shows distribution of time between work and non-work activities but no attempt was made to quantify the amount of time (*time*), sequencing or segmentation of time (*timing - location and fragmentation*) between the domains. Data was collected on the amount of time committed to work and the time spent in food related activities; thus attempting to quantify the amount of time in each of these domains. However, it has also been highlighted in chapter two that the experience of time, in particular time famine, is not related to time availability, lack of time, or quantitative time alone. In his article *"Convenience Food: space and timing"* Alan Warde (1999:519) suggests that time-use and time-budgets (measures of quantitative time) are not suitable dependant variables for measuring the consumption of convenience foods. Thus, an attempt was made to evaluate the sequencing and segmentation of work time by measuring shift work (*location*) and flexibility (*fragmentation*). However, the validity of using time and timing as a conceptual basis to describe the nature of association between work and food has been questioned - (section 7.1).

Based on this conceptual interpretation of work, the association with food provision, consumption and eating patterns was explored. It has become clear from the analysis and interpretation of the data, that describing work and the resulting time constraints only in terms of time and timing is one of the main limitations of the conceptual framework. The discussion in section 7.1 highlights the significance of time and timing but also the importance of the perceptions that people have of the time available to them and the value placed on time. The integration of these dimensions of time use (shown in Figure 7.1) appear to be key in the development of coping strategies which are employed in managing food related activities in the household; not only in terms of the amount of time spent in food provision but also in the division of responsibility for food related tasks, the types of food consumed and patterns of eating together as a family.

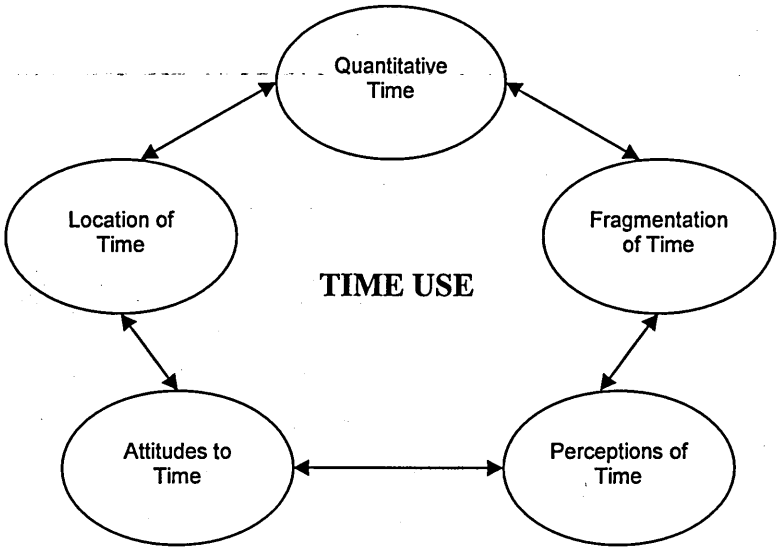


Figure 7.1 Hypothetical Model of Time Use - developed using themes from the analysis

Gershuny and Sullivan (2001) have identified perceptions of time as an important contributor to the experience of time famine; *"As we become older our commitments tend to increase (our paid work time, our family responsibilities etc.) so that when we think about our own lack of time, we are actually making a comparison with earlier stages of our own lives"* (Gershuny & Sullivan, 2001:21). Whilst it is true that the quantitative amount of time and the location of time throughout the day are important indicators of time availability, an individual's perception of time is also an important consideration. Greater involvement in work, juggling responsibilities and managing the differing schedules of family members may lead people to perceive that there is not enough time to do everything. Thus, time famine may be experienced when an individual's ability to cope with the demands on their time exceeds their perception of the time available. This is an important consideration and one which was not directly measured in the empirical data collection.

Additionally, attitudes towards time are another dimension which have not been measured directly. Ajzen and Fishbein's (1980) theory of reasoned action is often used to explain behaviour in terms of attitudes and subjective norm (beliefs of significant other and motivation to comply). Although attitudes towards food and healthy eating have been measured, attitudes towards time have not been considered. This may be a significant limitation in the conceptual and operational models presented in chapters two and three. Davies (1997) considered the relationship between time, food shopping and food preparation; he found that attitudes towards time were more important than time pressures, in determining behaviour.

It is possible therefore that the model of time use, developed using measures of quantitative time and fragmentation and location of time, is flawed as it does not take into account perceptions and attitudes. Thus, an alternative model of time use is presented in Figure 7.1.

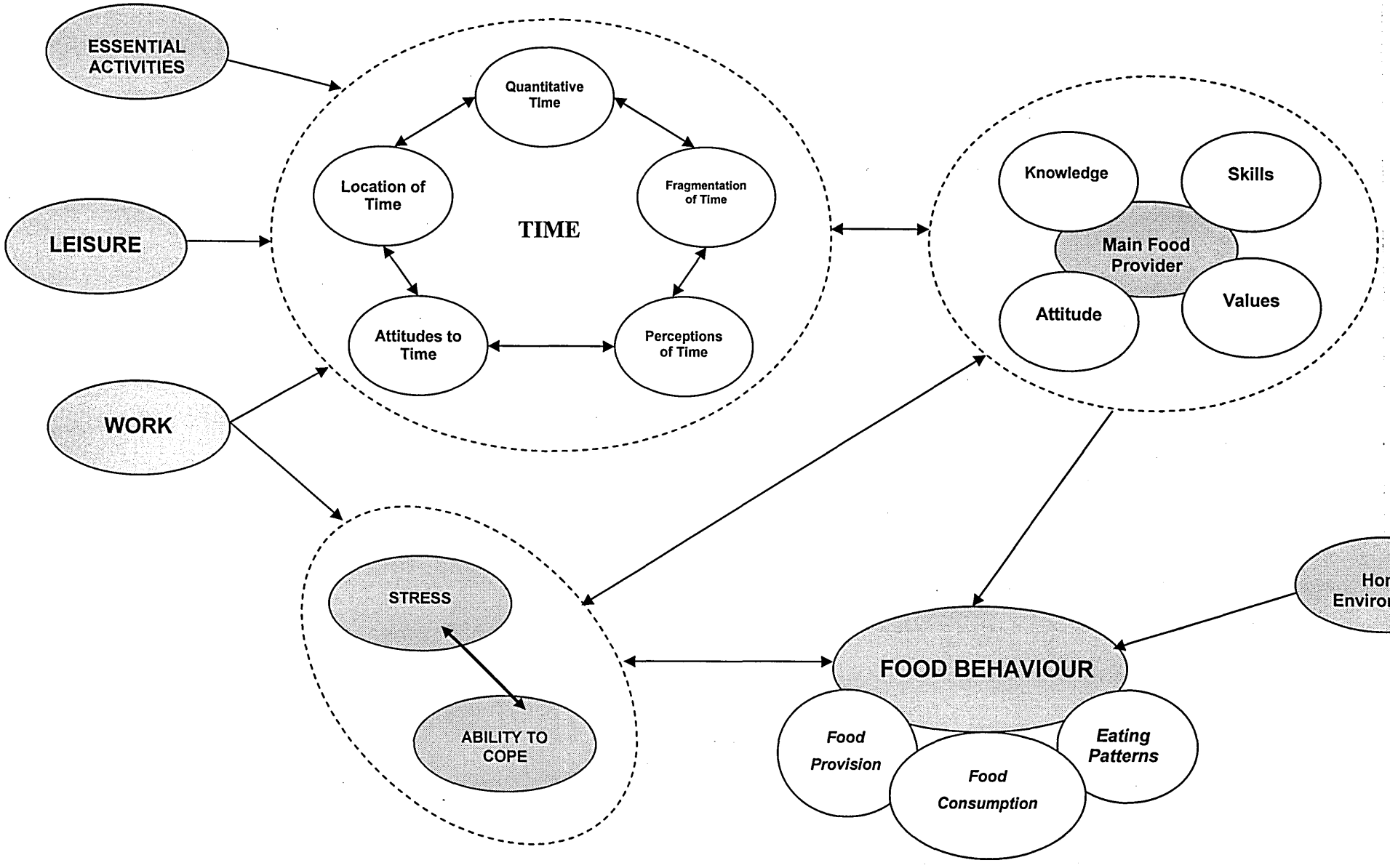


Figure 7.2 Revised Conceptual Model

Chapter 8 - Conclusions

8.1 Main Findings of the Study

This research set out to explore the association between work and food behaviour within the context of family life. Increasing female employment and long working hours have led to concern about the impact of work on family functioning, particularly with regards to food behaviour, although there is little empirical research to support this.

8.1.1 Contribution to Knowledge

Work and family life are interdependent but there is no clear understanding of the nature of association between the two (Barling, 1995). Previous research has looked at the contribution of work to the experience of time famine (Gershuny & Sullivan, 2000), suggesting that time use is an influential factor in the association between work and family life. In terms of food behaviour, time use has been explored in relation to consumption of convenience food; with sequencing and segmentation of time, as well as the amount of time available for food provision, being considered (Gofton 1995, Warde 1999). **However, time use has not been explored in relation to more general patterns of food consumption particularly in terms of the relative healthiness of the diet.** Lappalainen *et al* (1998) identified lack of time, irregular working hours and busy lifestyle as barriers to adopting a healthier; suggesting that elements of work and time may also determine the relative healthiness of the diet. **No attempt was made to define these elements of work and time or to measure their association with food consumption.** Considering more general models of food choice several non-work factors were identified as determinants of food consumption; intrinsic factors such as nutrition knowledge, cooking skills and attitudes to food and nutrition; extrinsic factors such as income and help in the home (Shepherd and Sparks, 1994). **However, these factors had not previously been examined as mediators of an association between work and food behaviour.**

Therefore, the original element of this research was to bring together previously unrelated areas of study and develop a conceptual model to describe the association between work and food behaviour. Work and time use have been considered, not only in terms of their impact on convenience food, but also on more general patterns of food consumption and the relative healthiness of the diet. Within the context of the family, characteristics of the main food provider (intrinsic factors) and of the home environment (extrinsic factors) have been explored as mediating factors in the association between work and food behaviour.

8.1.2 Reviewing the Aims and Objectives

The main aims of this study were to determine the nature of any association between work and food behaviour and identify factors, related to the home, work environment or the main food provider that could mediate any such association.

A review of the literature identified several mechanisms by which an association could exist:

- Time - work alters the amount of time, the location of time and fragmentation of time available for food related activities within the household.
- Stress - work affects job satisfaction levels, which in turn determine levels of work, related stress experienced by the main food provider.
- Knowledge/Attitude/ Skills - the knowledge, attitudes and skills of the main food provider relating to food and nutrition will determine food behaviour, mediating the effect of time constraints and stress resulting from work.
- Resources - income and support from internal and external sources, will determine food behaviour irrespective of work related time constraints and stress.

Based on these dimensions of the conceptual framework indicators of work and food behaviour were identified and incorporated into an operational model.

Several research methodologies were reviewed to identify the most suitable and practical method for empirical data collection. A survey design was chosen because it allowed both the descriptive and explanatory elements of the research design to be incorporated; data collection was by means of a postal questionnaire. Using this method allowed a general impression of the association between work and food behaviour to be obtained but for additional depth, further research is required. The use of family activity diaries and interviews with the main food provider would provide additional data and allow the true nature of the associations identified in this research to be explored in greater detail.

The statistical analysis of the survey data had two main objectives; firstly, to describe the study population in terms of their work, food behaviour, characteristics of the main food provider and household resources; secondly, to test for association between these variables based on the associations identified on the operational model. This was achieved using a combination of descriptive and exploratory statistical tests. Qualitative analysis of the questionnaire comments, relating to food behaviour within the home, was used in the interpretation and discussion of the results from the quantitative analysis.

The results suggest that a time based conceptual model, using quantitative time and timing resulting from work, is inadequate. This model was built on the assumption that a linear relationship existed for time use behaviour within the household; for example, *more time in work equals less time to spend in food related activities*. Although increased working hours (*decreased time available for food*) were found to be associated with more equal division of responsibility for food provision, no strong association was found with food consumption and eating patterns. Thus, time constraints resulting from work, in their quantitative sense, were not found to impact on the time spent in food provision activities, choice of foods consumed or eating patterns; supporting previous work which, although concerned with convenience food usage, also considers time constraints resulting from timing to be most significant (Gofton 1995b, Warde 1999)

The timing of working hours, represented by shift work and flexibility (*location and fragmentation of the time available for food*), was not associated with food provision, consumption or eating patterns. However, qualitative analysis of the questionnaire comments identified shift work and the differing schedules of family members as essential influences on food preparation, the types of food consumed and eating patterns. It is suspected that the validity of using shift work and flexibility as indicators of the timing of working hours is flawed and this may account for these anomalous results.

It is also proposed that the time based model should include additional dimensions, relating to perceptions of time and attitudes towards time, as well as quantitative time and timing. The research of Lappalainen *et al* (1998) which identified *"lack of time, irregular working hours, and busy lifestyle"* as barriers to adopting a healthier diet did not attempt to explain or quantify these factors. This research has highlighted the problem with using abstract concepts such as *"lack of time"* which could have several explanations; for example, quantitatively not enough time available to carry out necessary food related activities; or time fragmented so that there is not enough time available, at any one time; or time located at inconvenient points throughout the day; or the location and fragmentation of time leading to a perception that there is not enough time available to prepare healthy food; finally, an attitude which places value on time for activities other than healthy food. As this demonstrates using a time based model to describe the association between work and food behaviour is complex and involves more than a simple time distribution equation.

The stress based model did not yield any association with food behaviour. Job satisfaction was used as an indicator of work related stress but the validity of this as a measure of stress is in doubt. The elements that were used to describe job satisfaction (autonomy, feedback,

environment and reward) are also measures of job quality, and whilst this has been shown to be a contributor to work related stress, it does not attempt to measure the ability to cope with stress.

Qualitative analysis highlights the importance of the ability to adopt effective ways of managing time deficits and differing schedules of household members. It is proposed that this, rather than intrinsic and extrinsic factors of the work situation, are essential determinants of stress. Thus, work related stress might result from an individual's ability to cope with time constraints and schedules rather than from the job and work environment itself.

The strongest associations have been found between nutrition knowledge, health orientated attitudes to food and nutrition and food consumption. These characteristics of the main food provider have been found to affect general patterns of food consumption and increase the likelihood of healthier foods being consumed. The results from the qualitative analysis also suggest that the characteristics of the main food provider will determine the value placed on time and perceptions of time, for food provision. In family situations parents may prioritise food behaviour to provide home cooked meals, healthier food choices and eating patterns which they may feel are important for their children's well-being and family socialisation. In such cases, the work commitments and any resulting time pressures will be dealt with to reflect the family's priorities.

8.1.3 Conclusion

In conclusion, no direct association has been found between work and food behaviour based on the redistribution of time alone. Rather, an overview has developed of the ways in which individual's and families deal with time constraints that result from work and other activities within the home. This occurs in two ways; through intrinsic mechanisms related to the characteristics of the main food provider and other adult in the household; also through extrinsic mechanisms related to the development of coping strategies. Both intrinsic and extrinsic means can be summarised as follows:

Prioritising time for food

The priorities within the home are determined by the main food provider in conjunction with the other adult, where applicable. Food within the home may be prioritised to ensure the maintenance of family meal times or the provision of a healthy diet (or both). In such cases, time is prioritised for food and sacrifices may be made in other areas, such as the time spent in leisure activities. The priorities of a family will depend on the attitudes and values of the main food provider and other adult in the home.

Attitude to food and nutrition

A positive attitude facilitates preparation and planning; thus enabling the provision of home cooked convenience meals when time constraints are experienced. This may also be associated with pleasure and enjoyment of cooking and eating, thus meal times are more likely to be considered as opportunities for socialisation; this may have implications for opportunities to gain knowledge and skills within the home. A negative attitude may inhibit preparation and planning, leading to a greater reliance on shop bought convenience products. This may also be associated with food preparation and cooking being viewed as a chore and burden.

Attitudes to food and nutrition will also determine the value placed on healthy eating and meal times together as a family, which will again influence the family's priorities.

Coping with diversity

Differing family schedules due to work and other activities are managed according to the priorities, attitudes and value placed on food and food related activities. Diversity within the home environment is introduced by differing family schedules, meaning that family members are not in the household at the same time. Coping strategies may be developed to manage these schedules without compromising priorities and values. Diversity is also introduced by differing food preferences within the family. If several meals must be prepared to cater for individual likes and dislikes this can contribute significantly to the time and labour intensity of food preparation and cooking.

Shared responsibility

Greater shared responsibility for food related activities within the home might be one way of managing diversity within the home. Amore equal distribution of the responsibility for food activities is dependent on work timing. Thus, it is important for partnerships to develop between the adults, even between the adults and children, to develop coping strategies which take into account differing schedules.

Finally, the results suggest that an association does exist but that further research is required to elucidate its true nature and the mechanisms by which work affects food behaviour. It appears that any association is not based on time alone but on the coping strategies which families adopt to facilitate food related activities; it is also dependant on the attitudes and values of family members. These factors will not only affect the adoption of a healthy diet but Laos the opportunities available for meal time socialisation; both of which have implications for the provision of practical knowledge and skills within the home.

8.2 Implications and Recommendations for Further Work

This research has succeeded in bringing together previously unrelated areas of study. It has also given an insight to ways in which work and food related activities are prioritised and managed within the home. The scope of this investigation was considerable; whilst it was impossible to develop a detailed understanding of the association between work and food behaviour an overview of the factors involved was gained. This perception of the research problem has implications, not only for the meaning of the results but also for the development of future study in this area. In addition, further questions have been raised that could not be answered within the scope of this research. Consequently, these underlie the recommendations for future work.

8.2.1 Implications of the research findings

The overall inference of the results, is that work does not necessarily lead to deterioration in food behaviour, with less healthy food being consumed and the loss of family meal times. There are associations between work and food behaviour but families have strategies in place to deal with the impact of work; the value placed on food and healthy eating may determine the effectiveness of the coping mechanisms in place.

The implications of this research can be considered in four main areas:

Implications for families

Very often negative coverage is given to the impact of work on family life. However, from this research there is no evidence to suggest that the mother is any less of a role model, simply because she devotes more time to work activities. It is far more likely that her attitudes towards food provision and the value that she places on choosing a healthy diet for her family are the main influences. The importance of developing mutually supportive relationships within the home has also been identified as important in coping with the conflicting demands of work and home, also important in managing diversity in schedules and food preferences.

Implications for health educators

More research will need to be undertaken to understand the true relationship of nutrition knowledge and attitudes in determining food behaviour. In terms of home economics interventions and the promotion of a healthier diet, the focus should be on increasing the value

of these activities; providing knowledge and skills to support individuals who may be more susceptible to work related pressures. Although there is an enormous amount of dietary advice available very often it is not adhered to because people feel that it is irrelevant or that it would be too difficult to implement in their everyday lives (Ruxton, 1999). Therefore, the need for targeted and practical advice aimed at the specific problems faced by those who experience greater stress trying to cope with work and family pressures needs to be explored.

Implications for organisations

The timing of work commitments has been associated with food behaviour; although the quantitative analysis did not show association, the qualitative results highlighted timing as critical. Therefore, organisations that allow greater flexibility over working hours may facilitate in the development of coping strategies by allowing employees greater control.

8.2.2 Recommendations for future work

The recommendations for further research can be divided into conceptual issues and methodological developments. The former are concerned with widening the scope of the research to incorporate issues arising from the discussion; the latter concerned with building a suitable database which can be used to explore these issues.

Exploration of the value placed on food and on time is needed; specifically, the value placed on healthy eating, leisure activities and time use. The value placed on food provision and family meal times was identified as an important factor in developing and prioritising healthy food consumption. Therefore, it is recommended that the values of the main food provider and family members be investigated, particularly relating to the development of coping strategies; ideally leading to a value hierarchy to evaluate the prioritisation of food activities.

The discussion in section 7.2.3 also suggests that the attitudes of the main food provider require further consideration. A stronger association between work and food behaviour may not have been demonstrated due bias towards more health orientated attitudes that were inherent in the sample. Future research might attempt to obtain a sample with differing attitudes and values towards food and nutrition. One way in which this could be achieved would be to use a *"snowballing technique"*. Respondents interested in completing the questionnaire are also asked to nominate friends or relatives (with similar background, family size, ages etc.) who may be less interested in food issues. Using this approach, a sample might be obtained with less homogenous attitudes and values towards food, nutrition and health. Another approach would be the post stratification of the sample into groups characterised by their attitudes and values. Within each group, the relationship between work and food behaviour could be explored.

However, some attempt to diversify the sample in terms of their attitudes and values must be included in this approach otherwise stratification will only identify groups within an already positively skewed sample.

It is also recommended that coping strategies be considered in terms of household diversity. Family schedules and food preferences have been identified as factors that require family members to adopt suitable coping strategies. To explore these issues fully an understanding is needed of how diversity develops within a household and the individual and family response; in other words ways of coping with differing needs and demands of household members.

To meet these recommendations additional data is required; this may be obtained using food and activity diaries which will yield data on time use, fragmentation and location of time throughout the day. It will allow patterns of time use to be observed and time sacrifices and compromises to be identified. In addition, to qualitative interviews with the main food provider this will all a more detailed analysis to be made of coping strategies and their impact on time use and food behaviour.

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Appendices

Appendix A

Food and Nutrition Recommendations from COMA report on the Nutritional Aspects of Cardiovascular Disease (1994).

Appendix B

The Balance of Good Health - tilted plate National Food Guide.

Appendix C

Unemployment rates for Sheffield wards.

Appendix D

List of primary schools contacted and used for the distribution of questionnaires.

Appendix E

Final Questionnaire.

Appendix F

Correspondence with schools.

Appendix G

Correspondence with parents.

Appendix H

Illustrative example of changes to the National Food Survey results if the COMA (1994) recommendations were to be met.

Appendix I

Developing a Healthy Eating Score - definition of pragmatic acceptable limits.

Appendix J

Scoring for attitudinal statements.

Appendix K

Food items from questionnaire used to calculate food item totals.

Appendix A

Food and Nutrition Recommendations from COMA report on the Nutritional Aspects of Cardiovascular Disease (1994).

APPENDIX A - COMA RECOMMENDATIONS

Department of Health
Report on Health and Social Subjects
46 Nutritional Aspects of Cardiovascular Disease
Report of the Cardiovascular Review Group
Committee on Medical Aspects

R.2 Nutrient recommendations

R.2.1 We recommend that the average contribution of saturated fatty acids to dietary energy be reduced to no more than about 10 per cent.

R.2.2 We recommend no further increase in average intakes of n-6 PUFA and we recommend that the proportion of the population consuming in excess of about 10% of energy should not increase.

R.2.3 We recommend an increase in population average consumption of long chain n-3 PUFA from about 0.1g/day to about 0.2g/day (1.5 g/week)

R.2.4 We recommend that, on average, trans fatty acids should provide no more than the current average of about 2% of dietary energy and that consideration should be given to ways of decreasing the amount present in the diet.

R.2.5 We recommend no specific recommendations for monounsaturates

R.2.6 We recommend a reduction in the average contribution of total fat to dietary energy in the population to about 35 per cent.

R.2.7 We recommend that the average dietary intake of cholesterol should not rise.

R.2.8 Complex carbohydrates, and sugars in fruits and vegetables, should restore the energy deficit following a reduction in the dietary intake of fat. We recommend that the proportion of dietary energy derived from carbohydrates should increase to approximately 50 per cent.

R.2.9 We recommend a reduction in the average intake of sodium (principally from common salt (sodium chloride)) by the adult population from the current level of about 150 mmol/day

(equivalent to 9g salt/day) to about 100 mmol/day (6g salt/day). We also recommend a similar proportionate reduction in the sodium content of children's diets, but there are currently insufficient data to quantify this.

R.2.10 We recommend that food manufacturers, caterers and individuals explore and grasp the opportunities for reducing the sodium content of foods and meals.

R.2.11 We recommend an increase in the average intake of potassium by the adult population to about 3.5 g/day (90mmol/day). We also recommend a similar proportionate increase in the potassium content of children's diets, but there are currently insufficient data to quantify this.

R.3 Food recommendations

R.3.1 We recommend that people eat at least two portions of fish, of which one should be oily fish weekly.

R.3.2 We recommend that people use reduced fat spreads and dairy products instead of full fat products.

R.3.3 We recommend that people replace fats rich in saturated fatty acids with oils and fats low in saturated fatty acids and rich in monounsaturated fatty acids. An increase in the use of such oils could off-set a reduction in monounsaturates arising from decreased consumption of foods rich in both saturates and in monounsaturates.

R.3.4 We recommend that the consumption of vegetables, fruit, potatoes and bread is increased by at least 50%.

Appendix B

The Balance of Good Health - tilted plate

National Food Guide.

Introducing the National Food Guide

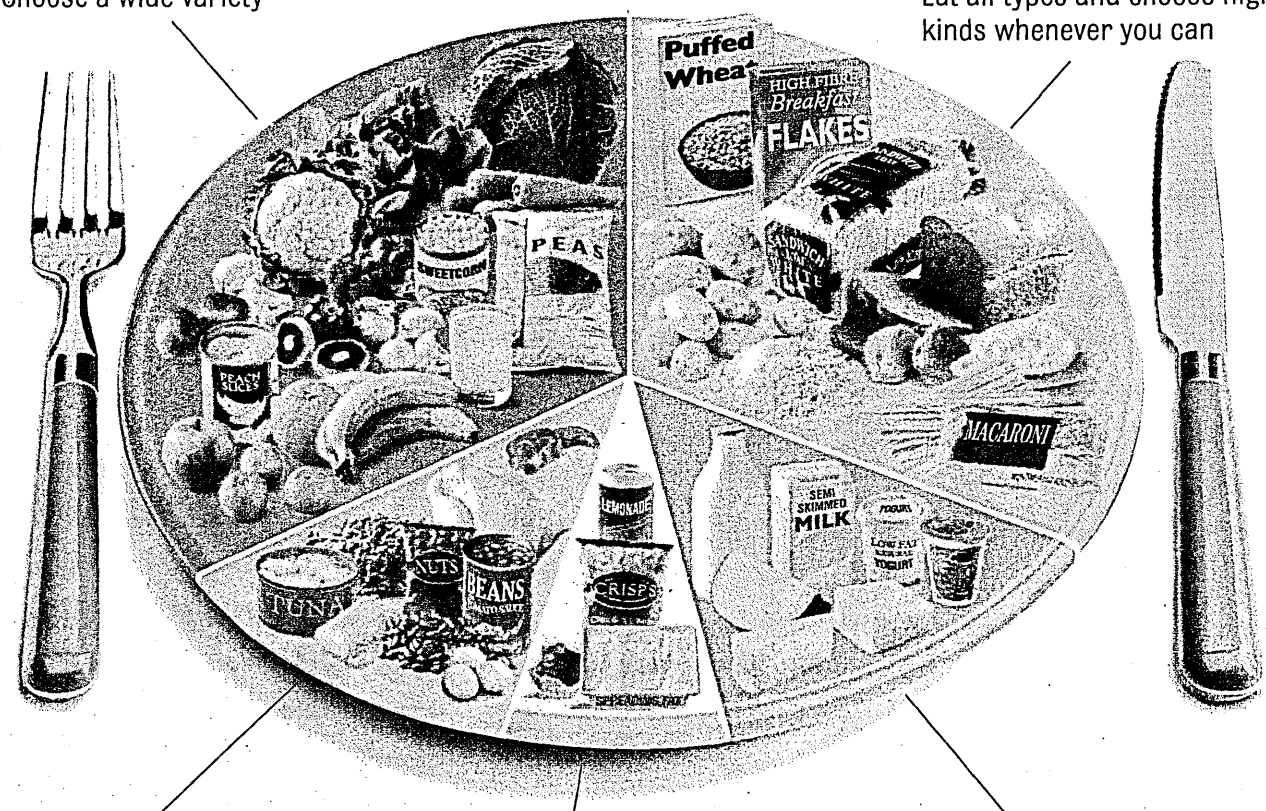
The Balance of Good Health

Information for educators and communicators

The new National Food Guide, *The Balance of Good Health*, aims to help people understand and enjoy healthy eating. It shows that people don't have to give up the foods they most enjoy for the sake of their health. But variety and a change towards more vegetables, fruit, bread, breakfast cereals, potatoes, rice and pasta is what matters. Snacks as well as meals count towards the healthy balance.

Fruit and vegetables
Choose a wide variety

Bread, other cereals and potatoes
Eat all types and choose high fibre kinds whenever you can



Meat, fish and alternatives
Choose lower fat alternatives whenever you can

Fatty and sugary foods
Try not to eat these too often, and when you do, have small amounts

Milk and dairy foods
Choose lower fat alternatives whenever you can

Appendix C

Unemployment rates for Sheffield wards.

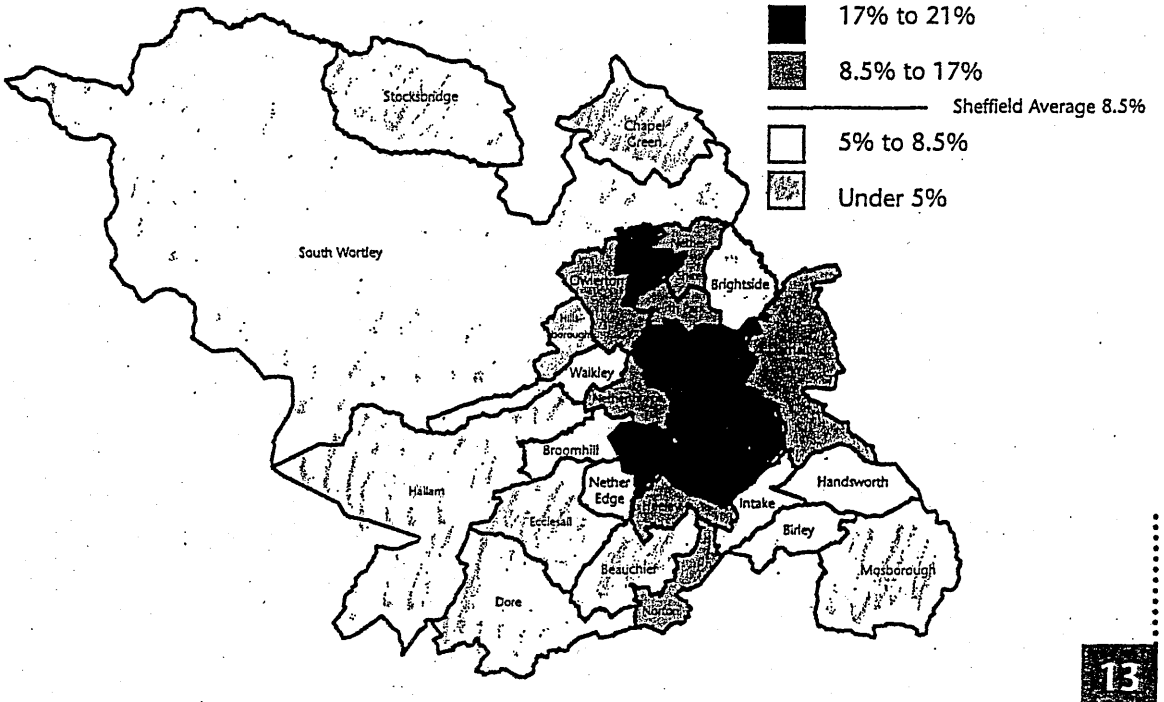
Revisions in the base used to calculate unemployment rates from January 1996 have resulted in changes to the rates previously published. A downward reduction in the estimated number of jobs in Sheffield, according to the 1996 Annual Employment Survey, means that recent unemployment rates have been revised upwards. This has resulted in a wider gap between the local and national rate than previously thought. Official figures now put the Sheffield unemployment rate in January 1996 2.6% higher than the UK rate, whereas previously the gap had been 2.2%. The gap widened to 2.8% in February and July 1996, since when the trend has been for Sheffield's rate to move closer to 2% above the national average. This means that the differential is back to the levels seen in 1994-5, but remains greater than at the height of the recession in 1992-3, when the gap reduced to as low as 1.6%.

The unemployment analysis above is based on the Sheffield Travel To Work Area (TTWA) as defined in 1984, which includes lower unemployment wards outside the city to the south and west. New TTWAs have now been introduced using the 1991 Census. Increased commuting has resulted in Sheffield and Rotherham being combined in a new TTWA.

TTWAs have been used in the past to analyse and compare local trends since they were the smallest areas for which official unemployment rates were calculated. However, at the same time as revising the TTWAs, the Office for National Statistics has now introduced official rates at District level for the first time and have backdated these to January 1996. Data at this new District-level shows that the average unemployment rate for the Sheffield District/TEC area in the first 7 months of 1998 was 7.4% - 2.5 percentage points higher than the national average. This data also shows that in each of the last 3 years, unemployment has fallen more slowly in percentage terms than it has done nationally. Rates of economic inactivity fell in 1997 to be closer to the national average. However, they remain 3 percentage points higher than the UK figure.

Average UK 4.9%

Unemployment Rates by Ward January 1998



Appendix D

List of primary schools contacted and used for the distribution of questionnaires.

APPENDIX D - Schools contacted and those who participated with the distribution of questionnaires

School	Address	Participated in Study
Abbey Lane Junior School	Abbey Lane	NO
Angram Bank Junior School	Kinsey Road, High Green	YES
Bradfield Dungworth Junior School	Dungworth	YES
Brook House Junior School	School Road	YES
Coit Junior School	Park Avenue, Chapeltown	YES
Dore Junior School	Furniss Avenue, Dore	NO
Ecclesall CE Junior School	Ringinglow Road	YES
Ecclesfield Junior School	High Street, Ecclesfield	NO
Emmanuel Junior School	Thorpe Drive	YES
Greengate Lane Junior School	Greengate Lane, High Green	YES
Greenhill Junior School	Greenhill Main Road	NO
Grenoside Junior School	Norfolk Hill, Grenoside	YES
Halfway Junior School	Halfway Centre, Halfway	YES
Hallam Junior School	Hallam Grange Crescent	NO
High Green Junior School	Wortley Road, High Green	YES
Hunters Bar Junior School	Sharrow Vale Road	NO
Lound Junior School	Loundside, Chapeltown	YES
Lowedges Junior School	Lowedges Road	NO
Loxley Junior School	Rodney Hill, Loxley	YES
Lydgate Junior School	Manchester Road	NO

School	Address	Participated in Study
Marlcliffe Junior School	Marlcliffe Road	YES
Mosborough Junior School	School Street	YES
Mundella Junior School	Mundella Place	YES
Nether Green Junior School	Fulwood Road	NO
Oughtibridge Junior School	Naylor Road, Oughtibridge	YES
Rainbow Forge Junior School	Beighton Road	YES
Reignhead Junior School	Platts Drive, Beighton	YES
St Maries's RC Junior School	Fulwood Road	YES
St Mary's (High Green) RC Junior School	Pack Horse Lane, High Green	YES
St Thomas More RC Junior School	Creswick Lane, Genoside	NO
St Thomas of Canterbury RC School	Chancet Wood Drive	YES
Short Brook Junior School	Westfield Way, North Way	NO
Shooters Grove Junior School	Wood Lane	NO
Sir Harold Jackson Junior School	Bradway Drive	YES
Totley Junior School	Sunnyvale Road, Totley	YES
Wharncliffe Side Junior School	Brightholmlee Lane	YES
Windmill Hill Junior School	Ash View, Chapeltown	YES
Wisewood Junior School	Ben Lane	YES
Woodseats Junior School	Chesterfield Road	YES
Dobcroft Junior School	Pingle Road	YES
Ballifield Junior School	Handsworth Grange Road, Handsworth	YES
Carfield Junior School	Argyle Road	YES
Hazlebarrow Junior School	Hazlebarrow Crescent	YES

Appendix E

Final Questionnaire.

Sheffield Hallam University

An Investigation into Working Patterns and Food Choice

This questionnaire is about the work commitments of the adults in your family and the food activities and food choices of the whole family.

Before you start we would like you to identify the main food provider in the family. If responsibility for food shopping, preparation and cooking is shared equally then please choose one adult.

Adult 1 - Main Food Provider .....
(name)

Adult 2 .....
(name)

The questionnaire has several short sections;

- Section **A** - About your work for **Adult 1** and **Adult 2** to complete
- Section **B, C & D** - for the **main food provider/Adult 1** to complete
- Section **E** - General information about your household

Please answer every question. If you are uncertain how to answer a question then do the best you can, but please do not leave a question blank.

Your answers will be treated as strictly confidential and will only be used for the purposes of this research.

ADULT 1

1. Occupation .....

.....

2. Is your employment...?

Full time ☐
Part time ☐
Self-employed ☐

3. How many days a week do you work?

..... Days

4. How many hours a week do you work?

..... Hours

5. What are your normal working hours?

From ..... To .....

From ..... To .....

If your hours are irregular please give details

.....

.....

6. Do you work in the evenings?

Never ☐
Occasionally ☐
Regularly ☐
Always ☐

7. Do you work at the weekends?

Never ☐
Occasionally ☐
Regularly ☐
Always ☐

8. Do you work any of the following....?

Flexi-time ☐
Job Share ☐
Term time ☐
Annual hours ☐
Work from home ☐
Shift-work ☐

ADULT 2

1. Occupation .....

.....

2. Is your employment...?

Full time ☐
Part time ☐
Self-employed ☐

3. How many days a week do you work?

..... Days

4. How many hours a week do you work?

..... Hours

5. What are your normal working hours?

From ..... To .....

From ..... To .....

If your hours are irregular please give details

.....

.....

6. Do you work in the evenings?

Never ☐
Occasionally ☐
Regularly ☐
Always ☐

7. Do you work at the weekends?

Never ☐
Occasionally ☐
Regularly ☐
Always ☐

8. Do you work any of the following....?

Flexi-time ☐
Job Share ☐
Term time ☐
Annual hours ☐
Work from home ☐
Shift-work ☐

Please indicate how satisfied or dissatisfied you are with each of these features of your present job by placing a tick in the appropriate box.

1	2	3	4	5	6	7
I'm extremely dissatisfied	I'm very dissatisfied	I'm moderately dissatisfied	I'm not sure	I'm moderately satisfied	I'm very satisfied	I'm extremely satisfied

ADULT 1

	1	2	3	4	5	6	7
The physical working conditions							
The freedom to choose own method of working							
Your fellow workers							
The recognition you get for good work							
Your immediate boss							
The amount of responsibility you are given							
Your rate of pay							
Your opportunity to use your abilities							
The relations with management							
Your chance of promotion							
The way the organisation is managed							
The attention paid to suggestions you make							
Your hours of work							
The amount of variety in your job							
Your job security							

10. On average how long do you spend in TOTAL travelling to and from work?

..... Hours .....Mins

Put a "0" if you work from home

11. What type of lunch do you usually have?

- **Work restaurant / canteen** ☐
- **Packed lunch at desk** ☐
- **Lunch outside work** ☐
- **Lunch at home** ☐
- **Other** please specify

_____

ADULT 2

	1	2	3	4	5	6	7
The physical working conditions							
The freedom to choose own method of working							
Your fellow workers							
The recognition you get for good work							
Your immediate boss							
The amount of responsibility you are given							
Your rate of pay							
Your opportunity to use your abilities							
The relations with management							
Your chance of promotion							
The way the organisation is managed							
The attention paid to suggestions you make							
Your hours of work							
The amount of variety in your job							
Your job security							

10. On average how long do you spend in TOTAL travelling to and from work?

..... Hours .....Mins

Put a "0" if you work from home

11. What type of lunch do you usually have?

- **Work restaurant / canteen** ☐
- **Packed lunch at desk** ☐
- **Lunch outside work** ☐
- **Lunch at home** ☐
- **Other** please specify

_____

This section of the questionnaire is about shopping for food, and preparing food for the family and should be completed by the main food provider.

1. How many times per week do you do .....? Please write in the number of times		2. When is the food shopping usually done? Tick all that apply							
		Daytime 8am-5pm	Evening 5pm-9pm	Night after 9pm	Weekday Mon - Fri	Saturday	Sunday	On the way home from work	During a break from work
Main Food Shopping									
Top Up Food Shopping									

3. Who usually does the food shopping for the family?

	MAIN FOOD SHOPPING			TOP UP FOOD SHOPPING		
	Never	Sometimes	Always	Never	Sometimes	Always
Adult 1 Main Food Provider						
Adult 2						
Both adults						
With children						

4. On average how much time is spent in TOTAL PER WEEK in food related shopping for the family?
Include ALL shopping trips in your estimation.

Less than ½ hour	☐	About 2-2½- hours	☐
About ½ -1 hour	☐	About 2½-3 hours	☐
About 1-1½ hours	☐	About 3-3½ hours	☐
About 1½-2 hours	☐	More than 3 hours	☐

5. Who does most of the food preparation for the family? Tick all that apply.

	DURING THE WEEK			AT THE WEEKEND		
	Never	Sometimes	Always	Never	Sometimes	Always
Partner 1 Main Food Provider						
Partner 2						
Both adults						
With children						

6. On average how much time does the main family meal take to prepare.....?

During the week .....

At the weekend .....

7. How often do you AND the members of your family ....?	DURING THE WEEK					AT THE WEEKEND				
	Never	Less than 1 a month	2-3 times a month	Once a week	More than 1 a week	Never	Less than 1 a month	2-3 times a month	Once a week	More than 1 a week
Have a take-away or home delivered food										
Eat out as a family										

8. How often do the members of your family eat the main meal .....?

	DURING THE WEEK			AT THE WEEKEND		
	Never	Sometimes	Always	Never	Sometimes	Always
All together (both adults and children)						
1 adult and children						
Children alone						
Adults alone						

9. During term time, what type of lunch do your children have?

School dinners	☐	Lunch at home	☐
Packed lunch	☐	Other	☐
Buy own lunch outside school	☐	Please specify	

10. Do you have paid help in the home? (child care, cleaner, cook etc) YES ☐ NO ☐

If YES, please state what type of help and for how many hours each week.

.....

.....

11. Do you have *regular* help from any unpaid source? YES ☐ NO ☐
(grandparents, other relatives, friends, etc.)

If YES, please state what type of help and for how many hours each week.

.....

.....

12. If there is any other information which you would like to give regarding the purchasing and preparation of food for the household, please give details below.

.....

.....

.....

Below is a list of food items which have been divided into sections according to food type.

- For each food item please think about the average number of times it has been eaten by your family in the last year and put a tick in the appropriate box.
- Please put only ONE tick per line.

Please ignore individual likes and dislikes within the family and think about the general types of food you and your family eat.

FOODS	HOW OFTEN FOODS ARE EATEN BY FAMILY							
	Never or Rarely	1-3 a month	Once a week	2-4 per week	5-6 per week	Once a day	2-4 per day	5 or more per day
BREAD								
White bread & rolls								
Wholemeal / brown bread & rolls								
BREAKFAST CEREALS								
Cereals - plain								
Sugar coated cereals								
High fibre cereals - Bran Flakes, Weetabix, muesli, porridge								
DAIRY PRODUCTS AND EGGS								
Milk - all types								
Cream								
Butter and margarine								
Full fat yoghurt								
Full fat cheese								
Reduced fat yoghurt								
Reduced fat cheese								
Eggs								
FRUIT								
Fresh fruit - apples, bananas, pears, etc.								
Tinned fruit - peaches, fruit salad, etc.								
Stewed fruit - apple, rhubarb, etc.								
Dried fruit - raisins, apricots, etc.								
VEGETABLES								
Fresh Vegetables - not potatoes								
Frozen Vegetables - not potatoes								
Salad - lettuce, cucumber, tomato, etc.								
Pulses- lentils, beans, chickpeas								
Baked beans								
Tinned Vegetables								
POTATOES, RICE AND PASTA								
Potatoes - boiled, mashed, jackets								
Chips or roast potatoes								
Potato products - waffles, hash browns								
Rice								
Pasta								
SAUCES AND SPREADS								
Tomato based sauces								
Creamy sauces								
Jam, honey, sweet spreads								

FOODS	HOW OFTEN FOODS ARE EATEN BY FAMILY							
	Never or Rarely	1-3 a month	Once a week	2-4 per week	5-6 per week	Once a day	2-4 per day	5 or more per day
MEAT, FISH & SUBSTITUTES								
Meat - roast, chops & mince (beef, pork, lamb)								
Poultry - chicken, turkey								
White fish, fresh or frozen								
Oily fish - fresh or tin, tuna, salmon, etc								
Meat pies, pork pies, pasties								
Vegetable pies and pasties								
Sausages and burgers - meat								
Sausages and burgers - veggie								
Cold cooked meats, pate and deli type sausages								
Pizza								
SNACKS, SWEETS, DESSERTS								
Potato crisps or other packet snacks, savoury biscuits								
Sweet biscuits, chocolate bars								
Cake, sweet pies and pastries								
Puddings - ice cream, milk puddings, etc.								
Sweets								
DRINKS	For alcoholic drinks think about adult consumption							
Tea								
Coffee								
Wine								
Beer, lager or cider								
Spirits								
Diet fizzy drinks and cordial								
Fizzy soft drinks and cordial								
Pure fruit juice								

How often do you use the following types of time saving products?								
	Never or Rarely	1-3 a month	Once a week	2-4 per week	5-6 per week	Once a day	2-4 per day	5 or more per day
Frozen and chilled ready meals								
Ready washed and prepared vegetables or salads								
Fresh packet soups								
Fresh packet sauces								
Jars of ready made sauces								
Packet grated cheese								

Please write down which type and/or brand of margarine, butter or spread you use most often.

.....

Which type of milk do you use most often? Please tick

Full cream ☐
Semi-skimmed ☐
Skimmed ☐

Other ☐
Please specify

1. What is the highest level of your education?

Secondary school ☐
Further Education (6th form) ☐
Higher Education (university) ☐

2. Have you received any *formal* food and nutrition education? (e.g. home economics at school)

Please specify .....

Please indicate whether the following statements are true or false by ticking the appropriate box.	**TRUE**	**FALSE**
1. Low fat spread contains less than one quarter the fat of butter.		
2. Salad cream contains the same amount of fat as mayonnaise.		
3. All nuts contain more fat than raisins.		
4. Edam cheese contains less fat than traditional Cheddar cheese.		
5. Fat has more than twice the calories (energy), weight for weight, than sugar.		
6. About 50% of total energy intake should come from carbohydrates - bread, pasta, rice.		
7. The best way to reduce total energy intake is to reduce sugar in the diet.		
8. A high energy intake has been associated with obesity.		
9. It is recommended that people eat up to 3 portions of fruit and vegetables every day.		
10. Frozen vegetables are as good a source of vitamin C as fresh vegetables		
11. Fruit and vegetables are good sources of antioxidant vitamins.		
12. Tinned fruit contains the same amount of vitamin C as fresh fruit.		
13. Complex carbohydrates contain more starch and fibre than simple carbohydrates.		
14. Orange juice contains more fibre than an apple.		
15. A high fibre diet will help to develop strong teeth.		
16. A high fibre diet will help to prevent bowel cancer.		
17. A standard packet of potato crisps contains more sodium than a bowl of cornflakes.		
18. A low sodium (e.g. low in salt) diet will help to reduce high blood pressure.		
19. The main source of sodium in the diet is processed food.		
20. On average sodium intakes in the UK meet the dietary recommendations.		
21. Grilling rather than roasting or frying foods will lower their fat content.		
22. Protein foods, (e.g. meat, fish and dairy products) should form the main part of any meal.		
23. To keep vitamin C in fresh vegetables they should be cooked for a short time.		
24. Pasta meals should not be eaten if you are trying to lose weight.		
25. Eating less full fat dairy products will help to reduce the intake of saturated fat.		

Please read the following statements and state whether you agree or disagree with them. Please tick only one box per line.	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
1. Butter is natural therefore I prefer to buy it rather than margarine.					
2. It doesn't matter what type of fat you eat, all fats are harmful.					
3. Low fat foods are less acceptable to me because they don't taste as good.					
4. Eating between meals is bad for you.					
5. The amount of energy in food is more important to me than the nutrients.					
6. It doesn't matter what you eat as long as you vary your diet a lot.					
7. Increasing fruit and vegetables in my diet is time consuming.					
8. Increasing fruit and vegetables means choosing foods which I find boring.					
9. I would not choose fresh fruit as a snack as it is not filling enough.					
10. I prefer to buy white bread rather than wholemeal bread.					
11. Meals based on rice and pasta are not suitable for main family meals.					
12. I would not buy brown rice as it is expensive and takes too long to cook.					
13. Cutting out salt added at the table will lower my sodium intake.					
14. Reducing processed foods will not significantly reduce my sodium intake.					
15. Reduced sodium products are lacking in flavour.					
16. My cooking skills are adequate for preparing food for my family.					
17. I feel as though I have enough time to provide food for my family.					
18. I feel as though the foods I provide for my family are healthy & nutritious.					
19. Spending more time cooing means I can prepare a healthier family meal.					
20. Home made cakes and pastries are better for my family than shop bought.					

	What are your main sources of information regarding food and nutrition?	**Where did you gain your cooking skills?**
Formal education		
Mother		
Other family member please specify		
Partner		
Friends		
Health professional		
Media (TV, magazines, newspapers)		
Supermarkets		

1. **How many adults live in the household?** (over 16 years) .....

2. **How many children live in the household?** (under 16yrs) .....

Please write down the ages of the children below.

Child 1 _____ Child 4 _____
Child 2 _____ Child 5 _____
Child 3 _____ Child 6 _____

3. **Please estimate the TOTAL GROSS income available for the household.**

Less than £15,000	☐
£15,000 - £30,000	☐
£30,000 - £45,000	☐
£45,000 - £60,000	☐
More than £60,000	☐

4. **Does your household own/have access to a car?** YES ☐ NO ☐

5. **Are all members of the household in a generally good state of health?** YES ☐ NO ☐

If NO, please give some indication of the problem if you are able.

.....

THANK YOU FOR COMPLETING THE QUESTIONNAIRE

Your answers are VERY IMPORTANT to our research and will be treated with the strictest confidence.

If you would like to help us with further research into working patterns and food choice please give your name and address below, and we will contact you in the near future.

NAME	
ADDRESS	
TELEPHONE	

Appendix F

Correspondence with schools.

Sheffield Hallam University

Unit 1, Science Park, Howard Street, Sheffield, S1 2LX
Tel: 0114 225 4492

24 September 1999

Dear «Title» «LastName»

SHEFFIELD HALLAM UNIVERSITY / ALL SAINTS EDUCATIONAL TRUST

Research Project with Implications for National Curriculum Development

I am sure you are aware of current concerns about the nation's diet especially with coronary heart disease and obesity being top of the governments priorities in their recent report **"Our Healthier Nation"**. We are being told to *"eat more of this and less of that"* which is all very well, but most of us lead very busy lives, and time available for providing a healthy meal for ourselves and our families is limited.

With the number of dual earner families ever increasing, these time pressures are set to increase. The impact this may have on future generations is uncertain but nutrition education, in the community, in the workplace and in schools must take these factors into consideration, if it is to be successful in the long term. However, with little research focusing on the relationship between paid employment and food provision within households, effective recommendations cannot be made.

Therefore, I am writing to ask if you would be interested in helping me with some research, which is currently being undertaken at Sheffield Hallam University, into the working patterns and eating patterns of dual earner households with children.

Before you read any further I would like to stress that I am aware of the pressures under which you and your staff work and **I would like to assure you that the practical involvement of the school will be kept to a minimum**. Following discussions with *Rosemary Firth, Associate Primary Advisor at Sheffield Education Department*, they are willing to offer support for this research if you decide you would like to take part. At the end of the study we will also supply you with a copy of all the relevant research findings.

Where I would like your help is in initially contacting suitable households with children between the ages of 8-10 years. **I would like to send a letter home, addressed to the parents/guardians of all your year 4 and year 5 pupils asking them to contact me directly**. Details of the letter to be sent home with the children to their parents/guardians and further information about the study itself have been enclosed for your information.

I will telephone you at the end of next week (23/24 Sept) to discuss this letter and find out whether you would like to take part, but in the meantime if you have any further queries please do not hesitate to contact me on the above telephone number.

Yours sincerely

Rachel Hambly - Research Assistant
Barbara Harvey and Jacquie Salfield - Research Project Leaders

Investigation into the Relationship Between Working Patterns and Food Behaviour of Dual Earner Households with Primary School Children

The study is a three year research project which is being carried out at Sheffield Hallam University with funding from The All Saints Educational Trust, a charitable organisation which is particularly interested in the research and promotion of nutrition education. The project has been ongoing since December 1998 and I am now ready to undertake the main data collection phase. In order to do this I need to recruit a suitable sample which is where I hope you can be of some assistance.

Why your school has been chosen?

Due to the emphasis on work it was decided to recruit the study population from areas within Sheffield which have a higher proportion of dual earner households.
All schools within these areas have been contacted.

Recruiting the Study Population

I would like to recruit households with two working adults whose total working hours exceed 37 hours per week. Each household should have at least one child within the age range of 8-10 years and any other children should be below age 16.
I would like to send a letter home with each of your year 4 and year 5 pupils asking their parents/guardians if they would be willing to participate in the research. Those who are interested will be asked to contact me directly at Sheffield Hallam University by returning a slip at the end of the letter, in the prepaid envelope provided. Parents who do not wish to participate will have no further communication from me.

In summary:

The schools participation would involve;

- informing staff of the study
- asking staff of year 4 and year 5 pupils to hand out an envelope to each child
- asking each child to write their name on the envelope and take it home

The parents/guardians participation would involve;

- reading the letter sent home with their child (see attached)
- deciding whether they are eligible and interested in participating in the study
- if they would like to take part, contacting me directly by returning the printed slip at the end of the letter in the pre-paid envelope provided
- completing the questionnaires which will be sent directly to them (see attached)
- returning the questionnaires directly to me at Sheffield Hallam University

Finally, if you or any members of your staff are planning any food or nutrition related projects in school in the near future and would like any further information about the research which could be linked in with what you are doing, I would be more than happy to discuss this with you either at the school or over the telephone.

Please do not hesitate to contact me if you require any further information about the research and your involvement in the study.

11

Sheffield Hallam University

Unit 1, Science Park, Howard Street, Sheffield, S1 2LX
Tel: 0114 225 4492

11 January 2000

Dear «Title» «LastName»

INVESTIGATION INTO WORKING PATTERNS AND EATING PATTERNS

First of all I would like to say a big **"Thank-You"** to you and your staff for your help with the distribution of questionnaires for the above research project.

30 schools agreed to give out the questionnaires to their year 4 and year 5 pupils at the end of last year, and so far we have been really pleased with the response.

In total we have received just over 600 completed questionnaires from the parents, and the quality of the replies has been exceptional. However, we would like to make this number up to 1000 if possible and therefore I need to ask for your help once again.

I would like to send another letter to all your year 4 and year 5 parents, thanking those who have returned the completed questionnaire, and asking parents who haven't replied to send their questionnaires back. I have enclosed a copy of the letter for your approval.

Once again the letters would be sent to your school already sealed in an envelope to be handed out to your year 4 and year 5 pupils to take home to their parents.

I know I assured you at the outset that the school's involvement would be minimal, so as not to add to your already overstretched resources, but this extra letter would really boost our response rate and thus add to the validity of the research.

I am sorry to make extra demands on your precious time but your help would be very greatly appreciated. I will telephone you at the end of the week to gain your consent before sending the letters to your school for distribution.

Thank-you once again for your previous co-operation.

Yours sincerely

Rachel Hambly - Research Assistant
Barbara Harvey and Jacquie Salfield - Research Project Leaders

Sheffield Hallam University

Unit 1, Science Park, Howard Street, Sheffield, S1 2LX
Tel: 0114 225 4492

27 January 2000

Dear «Title» «LastName»

INVESTIGATION INTO WORKING PATTERNS AND EATING PATTERNS

Thank you for agreeing to help once again with the distribution of letters to your year 4 and year 5 pupils.

The envelopes in this parcel contain a copy of the letter to parents, which was attached to my last letter to you, dated 11 January 2000.

It would be helpful if you could distribute these envelopes to ALL your year 4 and year 5 pupils to take home, regardless of whether their parents have returned the questionnaire.

Hopefully this letter will further improve our response rate for the questionnaires. I will contact you again once all the data has been analysed to share the results of our research project with you.

Thank you once again to you and your staff for all your co-operation, it is very greatly appreciated.

Yours sincerely

Rachel Hambly - Research Assistant
Barbara Harvey and Jacquie Salfield - Research Project Leaders

IV

Appendix G

Correspondence with parents.

Sheffield Hallam University

Unit 1, Science Park, Howard Street, Sheffield, S1 2LX
Tel: 0114 225 4492

Dear Parent / Guardian

INVESTIGATION INTO WORKING PATTERNS AND EATING PATTERNS

Trying to juggle the demands of work and family life is not easy. We are looking at the way in which people cope with providing food for their families with the time that is available to them and we hope you would like to take part in our research.

I am sure you are aware of current concerns about the nation's diet especially with coronary heart disease and obesity being top of the governments priorities in their recent report **"Our Healthier Nation"**. We are being told to *"eat more of this and less of that"* which is all very well, but most of us lead very busy lives, and time available for providing a healthy meal for ourselves and our families is limited.

With the number of dual earner families ever increasing, these time pressures are set to increase. The impact this may have on future generations is uncertain but nutrition education, in the community, in the workplace and in schools must take these time pressures into consideration, if it is to be successful in the long term.

This is your chance to have your say and tell us how you cope with these everyday pressures. There has been very little research looking at the relationship between paid employment and food provision so your answers could be important in influencing future recommendations.

What does the study involve?

- All you need to do is complete the questionnaire enclosed with this letter.
- Return the questionnaire in the pre-paid envelope.
- It would be very helpful to us if we could have your completed questionnaire returned to us by **Friday 12th December 1999**.

Why have you been chosen?

- Your child is attending a school in an area of Sheffield which has a higher proportion of households in which both adults work (dual-earner households). All parents/guardians of year 4 and 5 pupils in these schools have been contacted.

We recognise how busy you must be and would greatly appreciate you taking time to complete this questionnaire. Your answers will be treated as strictly confidential and only used for the purposes of this research. No names or individual information will be used.

If you have any questions about the study or would like further information please don't hesitate to contact me on the above telephone number.
I look forward to hearing from you soon.

Rachel Hambly

Rachel Hambly - Research Assistant
Barbara Harvey and Jacquie Salfield - Research Project Leaders

Sheffield Hallam University

Unit 1, Science Park, Howard Street, Sheffield, S1 2LX
Tel: 0114 225 4492

Dear Parent / Guardian

INVESTIGATION INTO WORKING PATTERNS AND EATING PATTERNS

You may remember at the end of last year receiving a letter and questionnaire about your working patterns and eating patterns which was sent home with your child from school.

First of all I would like to say a big **"Thank-You"** to all of you who have returned your completed questionnaires to me.

So far I have had about **600** replies, which is fantastic, and I can assure you that all of these will be extremely useful to our research.

However, I would really like to make this number up to **1000** if at all possible.

Therefore, if there are any parents who did not get a chance to reply the first time but would still like to take part, I would love to receive your completed questionnaire.

I know the period before Christmas is especially hectic for many people. If you cannot remember seeing the questionnaire, or misplaced your copy, or did not have time to complete it, but would still like to take part it is not too late.

If you contact me on 0114 2254492 I will be more than happy to supply you with another questionnaire and a pre-paid envelope in which to return it.

Your answers will be treated as strictly confidential and only used for the purposes of this research. No names or individual information will be used.

Thank-you once again for taking the time to read this letter, and for the interest and support which many of you have already shown for this research. I hope many more of you will want to get involved - your replies could really make a difference.

If you have any questions about the study or would like further information please don't hesitate to contact me.

Rachel Hambly - Research Assistant
Barbara Harvey and Jacquie Salfield - Research Project Leaders

ii

Appendix H

Illustrative example of changes to the National Food Survey results if the COMA (1994) recommendations were to be met.

Table S.2: Illustrative example of changes to National Food Survey results if COMA's recommendations were met. The figures represent national averages, not recommendations for individuals (see Section S.3). Food and drinks provided and eaten away from home would be additional to the amounts shown below.

	Average household food consumption 1992 (National Food Survey)		Illustrative example of average household food consumption meeting COMA recommendations		Comment
Food Group	g/person/ week*	Rough equivalent in terms of portions	g/person/ week*	Rough equivalent in terms of portions	
Milk	1960 (ml)	1 glass whole milk plus 1 glass semi skimmed milk each day	2140 (ml)	½ glass whole milk and 1¼ glasses semi skimmed milk each day	Continues trend to low-fat milk. Cheese consumption is currently steady.
Other milk and cream	260 (ml)	1 tablespoon cream each day	130 (ml)	½ tablespoon each day	
Cheese	115	filling for 2-3 sandwiches each week	60	filling for 1-2 sandwiches each week	
Carcase beef and lamb	210	2 portions each week	210	2 portions *lean* meat each week (trimmed of visible fat)	For carcase meat the amount is left unchanged but a switch to leaner meat assumed; for meat products the example shows reduced consumption with no change in fat content.
Pork and poultry	300	3 portions each week	300	3 portions each week	
Other meat and meat products	440	7 portions each week	220	3½ portions each week (assumes 30% reduction in sodium content)	
Fish and fish products	140	1 portion white fish or fish products plus ½ portion oily fish	190	1 portion white fish or fish products plus 1 portion oily fish	In effect this means doubling the number of people eating sardines, salmon, etc in any week
Eggs	60	1 egg each week	60	1 egg each week	Assumes no change
Butter	40	spread for 3 slices bread each day	20	spread for 1½ slices bread each day	Continues switch to low-fat spreads and move from butter/ margarine/lard to vegetable oils for cooking
Margarine	80		40		
Low and reduced fat spreads	50	spread for 1 slice bread each day	120	spread for 2½ slices bread each day	
Vegetable oils	50	4½ tablespoons each week	100	9 tablespoons each week	
Other fats	25	1½ tablespoons each week	10	¾ tablespoon each week	

Table S.2 (cont): The figures represent national averages, not recommendations for individuals (see Section S.3).

	Average household food consumption 1992 (National Food Survey)		Illustrative example of average household food consumption meeting COMA recommendations		Comment
Food Group	g/person/ week*	Rough equivalent in terms of portions	g/person/ week*	Rough equivalent in terms of portions	
Potatoes	900	1 small portion potatoes (2 egg sized potatoes) each day	1260	1 medium portion potatoes (3 egg sized potatoes) each day	Assumes 50% increase in main categories; present trends are for fruit to increase (mainly juice) but potatoes and bread falling
Potato products	170	each week either: 2 potato croquettes or 1 medium portion chips	80	each week either: 1 potato croquette or small portion chips	
Vegetables and products	1130	2–3 portions each day	1690	4 portions each day (assumes 30% reduction in sodium content of processed vegetables)	
Fruit and products	930	1½ pieces fruit each day	1290	2 pieces fruit each day	
Bread	750	3 slices each day (of which 1½ slice wholemeal)	1130	4½ slices each day of which 1 slice wholemeal (assumes 30% reduction in sodium content)	
Buns, cakes and biscuits	290	3–4 biscuits each day	145	1–2 biscuits each day	Assumes 50% reduction, with no change from current composition
Breakfast cereals	130	1 bowl each day	130	1 bowl each day	Assumes no change
Other cereals	285	1 serving pasta or rice each day	285	1 serving pasta or rice each day	
Sugar and preserves	200	6 teaspoons sugar each day or (or good spread for 2 slices bread)	190	5 teaspoons sugar each day or (or thin spread for 2 slices bread)	Continues trends on sugar/ preserves and move to low-calorie soft drinks. Assumes small reduction in consumption of confectionery. Consumption of soft drinks and confectionery is probably heavily understated because much is bought for consumption away from home.
Soft drinks (containing sugar)	720 (ml)	2 cans each week	360 (ml)	1 can each week plus any amount sugar free drinks	
Chocolate confectionery	35	1 small bar each week	30	¾ small bar each week	
Sugar confectionery	15	3 boiled sweets each week	15	3 boiled sweets each week	
All other foods	440	2 tablespoons pickle or dressing each day	440	2 tablespoons pickle or dressing each day	Assumes no change

*Unless otherwise stated

Appendix I

Developing a Healthy Eating Score - definition of pragmatic acceptable limits.

APPENDIX I - Developing Pragmatic Acceptable Limits for the Development of a Healthy Eating Score Based on COMA (1994) Recommendations

The percentage of ideal portions, calculated in Table 5.28, can be used to obtain a healthy eating score for each household, as shown in Table 5.29.
These percentages for each food group are assigned a value depending on the pragmatic acceptable limits which we have defined for each food group intake.

Food Group Percentages	Formulae for calculating Healthy Eating Score from Food Group Percentages	Justification for limits
Starchy Foods (S%)	100%-150% = 1.0 < 100% = 1-((100-S%)/100) >150% = 1-((S%-150)/100)	Current recommendations suggest we increase our intake of starchy foods, therefore we have set a pragmatic limit of 150% for the maximum intake.
Fruit and Vegetables (FV%)	100%-150% = 1.0 < 100% = 1-((100-FV%)/100) >150% = 1-((FV%-150)/100)	Current recommendations suggest we increase our intake of fruit and vegetables, therefore we have set a pragmatic limit of 150% for the maximum intake.
Dairy Products (D%)	90%-110% = 1.0 < 90% = 1-((90-D%)/100) >110% = 1-((D%-110)/100)	Intakes of daily products should meet the recommendations as closely as possible therefore narrow limits are defined. Intakes above may have implications in terms of high fat intake and below in terms of inadequate calcium intakes.
Meat, Fish and Alternatives (MF%)	90%-110% = 1.0 < 90% = 1-((90-MF%)/100) >110% = 1-((MF%-110)/100)	Intakes of meat and fish should meet the recommendations as closely as possible therefore narrow limits are defined. Intakes above may have implications in terms of high fat intake.
Sweet and Fatty Foods (SF%)	0%-100% = 1.0 >100% = 1-((SF%-100)/100)	Intakes up to the recommended intakes are acceptable but anything higher is above the limit. Intakes below the recommendations of these foods do not pose a serious risk.

Appendix J

Scoring for attitudinal statements.

APPENDIX J - Scoring for Attitude Statements

Please read the following statements and state whether you agree or disagree with them. Please tick only one box per line.	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
1. Butter is natural therefore I prefer to buy it rather than margarine.	1	2	3	4	5
2. It doesn't matter what type of fat you eat, all fats are harmful.	1	2	3	4	5
3. Low fat foods are less acceptable to me because they don't taste as good.	1	2	3	4	5
4. Eating between meals is bad for you.	1	2	3	4	5
5. The amount of energy in food is more important to me than the nutrients.	1	2	3	4	5
6. It doesn't matter what you eat as long as you vary your diet a lot.	1	2	3	4	5
7. Increasing fruit and vegetables in my diet is time consuming.	1	2	3	4	5
8. Increasing fruit and vegetables means choosing foods which I find boring.	1	2	3	4	5
9. I would not choose fresh fruit as a snack as it is not filling enough.	1	2	3	4	5
10. I prefer to buy white bread rather than wholemeal bread.	1	2	3	4	5
11. Meals based on rice and pasta are not suitable for main family meals.	1	2	3	4	5
12. I would not buy brown rice as it is expensive and takes too long to cook.	0	0	0	0	0

13. Cutting out salt added at the table will lower my sodium intake.	5	4	3	2	1
14. Reducing processed foods will not significantly reduce my sodium intake.	1	2	3	4	5
15. Reduced sodium products are lacking in flavour.	1	2	3	4	5
16. My cooking skills are adequate for preparing food for my family.	5	4	3	2	1
17. I feel as though I have enough time to provide food for my family.	5	4	3	2	1
18. I feel as though the foods I provide for my family are healthy & nutritious.	5	4	3	2	1
19. Spending more time cooing means I can prepare a healthier family meal.	0	0	0	0	0
20. Home made cakes and pastries are better for my family than shop bought.	1	2	3	4	5

Appendix K

Food items from questionnaire used to calculate food item totals.

APPENDIX K - COMA FOOD CATEGORIES

The food intake data obtained from Section C on the questionnaire has been divided into the COMA food categories as shown in Table K1.

COMA Food Category	Recommended number of portions per week		Items to be included from questionnaire
Milk	11	4x whole milk, 7x semi-skim	Milk
Cream	3.5		Cream
Cheese	2		Full fat & Low fat Cheese
Meat	2		Meat
Poultry	3		Poultry
Meat Products	3.5		Meat pies, sausages & burgers, pate & deli meats.
Fish	2	1x oily fish, 1x white fish	White fish, oily fish
Eggs	1		Eggs
Butter/Margarine	6		Butter and marg
Low fat spread	12		
Vegetable oil	9		These items are not included in this section
Other fats	1		
Potatoes	7		Potatoes
Potato products	1		Potato products & chips
Vegetables and products	28		Fresh, frozen, salad, tinned
Fruit and products	14		Fresh, tinned, stewed, dried
Bread	31.5	7x wholemeal, 24.5x white	White bread, wholemeal
Buns, cakes and biscuits	10.5		Cakes, puddings
Breakfast cereal	7		Plain, sugary, high fibre
Other cereal	7		Rice, Pasta
Sugar, preserves	9.5		Jam,
Soft drinks	1		Fizzy drinks
Chocolate sweets	1		Chocolate bars
Sugary sweets	1		Sweets
Other foods	14		Creamy and tomato sauces
Total	**188.5**		

Table K1 Food Categories from COMA and the corresponding food items from questionaire

The mean household intake for each COMA food category has been calculated from the sum of the values given for the relevant food items on the questionnaire.
Discussion of these results is given at the end of chapter 6.

Note A1: *Some of the food items from the questionnaire have been omitted from the calculations for the intake of COMA food categories as they do not fit with recommendations. However, all items from the questionnaire have been included in the calculation of the food groups and healthy eating score which are based on the Balance of Good Health - see Appendix B.*

Food Items Omitted *- Full fat and reduced fat yoghurt, pulses, baked beans, vegetable pies and pasties, pizza, tea, coffee, wine, beer, spirits, diet fizzy drinks and all convenience products.*

Note A2: *It is assumed that the average houshold intake calculated from the questionnaire is for one member of the household. Some respondants may have completed the questionnaire and given average intake for ALL members of the household - this will be reflected by especially large values for the food group totals.*